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1. Newton-second is the unit of; **2019-Med** — D
a) work
b) angular momentum
c) power
d) linear momentum
ans; d
reason; p = mv
p = m at = Ft = N s

2. The dimension of electric dipole is **2019-Med** — B
a) [M3 L2 T0 A1]
b) [M0 L1 T1 A1]
c) [M0 L1 T1 A0]
d) [M2 L1 T3 A2]
ans; b
reason ; p = qd = Itd
= A s m = [M0 L1 T1 A1]

3. If the velocity of the body become half, then kinetic energy of the body becomes; **2019-Med** — A
a) one forth
b) double
c) four times
d) half
ans; a
reason; K.E = 1/2 mv2
k.E' = 1/2 m (v/2)2
k.E' = 1/2 m v2 /4
K.E' = 1/4 [1/2 mv2]
K.E' = 1/4 K.E

4. The angular acceleration of second hand minute of watch is; **2019-Med** — D
a) π rad/sec2
b)2π rad/sec2
c)π/2 rad/sec2
d)non of the above

5. The viscous drag on a small spherical body (moving with slow speed v) is proportional to — A
a)v b) $\sqrt{v}$
c)1$\sqrt{v}$ d) v2

6. the transverse nature of light is shown by — C
a) interference of light
b) refraction of light
c) polarization of light
d) dispersion of light

7. An electron is moving along the axis of a solenoid carrying a current. Which of the following is a correct statement about the magnetic force acting on the electron? — C
a) The force acts radially inwards
b) The force acts radially downwards
c) The force acts in the direction of motion
d) No force acts

8. The motional EMF depends upon — D
a) Strength of magnetic field
b) Speed of the conductor
c) Length of conductor
d) All of the above

9. Which one of the following physical quantity does not have dimension of force per unit area? — B
a) Stress b) strain
c) young modulus d) pressure

10. In case of germanium, the value of potential barrier develops across the depletion region is — B
a) OV b) 0.3V
c) 0.7V d) 0.9V

11. Electron microscope makes practical use of the — B
a) Particle nature of electron
b) Wave nature of electron
c) Dual nature of electron
d) None of the above

12. Projectile is thrown in such a way that its maximum height equals to its range, the angle of projection is — D
a) Tan-1 45 b) Tan-1 60
c) Tan-1 30 d) None

13. Which of the following pollutant decolorize the skin? **2019-Med** — B
a)mercury b) arsenic
c) lead d) cadmium

14. Car "X" is travelling at half speed of car "Y" and mass of car "X" is twice as compared to mass of car "Y" Which of the following statement is correct **2019-Med** — A
a) Car "X" has half the kinetic energy of car "Y
b) Car "X" has one quarter the K.E of car "Y"
c) Car "X" has twice K.E of car "Y"
d) The two cars have the same KE

15. If the wavelength of a transverse is 2cm and the period is 2 sec then the wave speed in CGS is **2019-Med** — D
a) 0.1cms-1 b) 0.2cms-1
c)11 cms-1 d) 1 cms-1

16. A car battery has EMF of 12 volts and internal resistance 5x 10 ohm. If it draws 60 ampere current, then terminal voltage of the battery will be **2019-Med** — D
a) 5 volts b) 3 volts
c) 15 volts d)9 volts

17. The cyclotron frequency of an electron projected with velocity V perpendicular to — C

a magnetic field B is given **2019-Med**
a) f = mB/πC b) f = 2πeB/m
c) f = eB/2πm d) f = 2πc/mB

18. if A. B= ½, the angle between A and B is **2019-Med** — C
a) Zero b) 300
c) 600 d) 900

19. A train is 200 m long and is moving with uniform velocity of 36 km/hr, the time it will take to cross a **2019-Med** bridge of 1km is — B
a) 100 sec b) 120 sec
c) 60 sec d) 50 sec

20. Choose the wrong statement. The escape velocity of a body from planet depend upon **2019-Med** — A
a) The mass of a body b) the mass of the planet
e) the average radius of the planet
d) the density of the planet

21. In order to increase the stopping potential, there should be increase in **2019-Med** — C
a) Intensity of radiation
b) Wavelength
e) Frequency of radiation
d) Both wavelength and intensity

22. Two meter high tank is full of water. A hole is made in the middle of the tank. The speed of efflux is — C
a) 4.9m/s b) 9.8m/s
c) 4.42 m/s d) 3.75 m/s

23. A hail and a rain drop of same radius are released from same height, the rain drop will reach — B
a) Before hail b) after hail
c) at the same time d) none of the above

24. Two springs A and B (Kg=2 Kg) are stretched by applying forces of equal magnitudes at the four ends. If the energy stored in Ais E, that is B is — B
a) E/2 b) 2E
c)E d) E/4

25. The general form of path difference in Young's double slit experiment is its corresponding phase shift (in radians) is — B
a) mπ b) 2mπ
c) mπ/2 d) None of the above

26. An a particle is accelerated through a potential difference of 10 volts. Its K.E is — B
a) 1 MeV b)2 MeV
c) 4MeV d) 8 MeV

27. If there are ° capacitors each of capacity "C connected in parallel to "V volt source then energy stored is equal to — B
a) CV b) ½ nCV2
c) CV2 d) CV2/2n

28. The electric field strength between a pair of plates is "E". if the separation of the plates is doubled and potential difference between the plates is increased by factor of four, the new field strength is — B
a) E b)2E
c) 4E 8) 8E

29. Two satellites of masses 3M" and "M" orbit the earth in a circular orbit of radius Y and "3r" respectively, the ratio of their speed is — B
a) 1:1 b) $\sqrt{3}$: 1
c) 3:1 d) 9:1

Two wires A and B are made of same material. The wire A has length L and diameter R. while the wire B has length 2L. and diameter R/2. If the two wires are stretched by the same force, the elongation in A divided by elongation in B is; — A
a) 1/8 b)½
c) 4 d) 8

30. A wire can sustain the weight of 20kg before breaking If the wire is cut into two equal parts each part can sustain a weight of — B
a) 10kg b) 20kg
c) 40kg d) 80kg

31. Which of the following is not EM wave — D
a) Radio waves b) X-rays
c) light waves d) sound waves

32. A shell of mass m moving with velocity v suddenly breaks into two pieces. The part having mass m/4 remains stationary. The velocity of the other shell will be — D
a) v b) 2v
c) 3v/4 d) 4v/3

33. Two blocks "A" and "B" having masses 3kg and 4kg are raised to the same height from earth surface. The ratio of gravitational potential of "A to that of "B" is — C
a) 3:4 b) 4:3
c) 1:1 d) None of the above

34. Heat and work are equivalent. This means **2019-Med** — C
a) When we supply heat to a body we do work on
b) When we do work on a body we supply heat to it.
c) The temperature of a body can be increased by doing work on it
d) Heat and work are neither inter convertible

35. The velocity time plot for a particular moving on a straight line is shown in the figure — C

2019-Med
a) The particle has a constant acceleration
b) The particle has never turned around
c) The particle has zero displacement
d) The data is insufficient

36. Mark out the correct options **2019-Med** — B
a) The energy of any small part of a string remains constant in a travelling wave.
b) The energy of any small part of a string remains constant in standing wave.
c) The energies of all small parts of equal length are equal in a travelling wave.
d) The energies of all the small parts of equal length are equal in a standing wave.

37. A system can be taken from the initial state P. V to the final state P1 V1 t o the final state P2V2 by two different methods. Let ΔQ and ΔW represent the heat given to the system and the work done by the system. Which of the following must be same in both the methods? **2019-Med** — C
a) ΔQ b) ΔW
c) ΔQ + ΔW d) ΔQ-ΔW

38. At what angle two forces 2F and $\sqrt{2F}$ must act so that their resultant is **2019-Med** $F\sqrt{10}$; — A
a) π/4 b) π/2c
c)2π d) non of the above

39. When 20 J of work was done on a gas. 40J of heat energy was released. If the initial internal energy of the gas was 70J. What is the final internal energy? **2019-Med** — C
a) 50 J b) 60J
c) 90J d)110J

40. Time required by the projectile to reach the summit point is **2019-Med** — C
a) $T = \sqrt{\frac{2H}{g}}$ b)$T = \sqrt{\frac{3H}{g}}$
c)$T = \sqrt{\frac{4H}{g}}$ d)$T = \sqrt{\frac{H}{g}}$

41. A source of sound of frequency 500 Hz is moving towards an observer with velocity 30m/sec. the speed of sound is 330m/s. The frequency heard by the observer is — A
a) 550 Hz b) 458.3Hz
c) 530Hz d) 545 Hz

42. If the area of hysteresis loop of a material is large the hysteresis loss in this material will be — C
a) Zero b) small
c) large d) none of the above

43. In Young's slit experiment, the separation between the slits in halved and distance between the slits and screen is doubled the fringe width is — D
a) Unchanged b) halved
c) double d) quadrupled

44. An object at the surface of the earth weighs 90N its weight at a distance 3R from the center of earth is — D
a) 8N b) 9N
c) 12N d) 10N

45. Capacitance of parallel plate capacitors independent of — C
a) Area of plates of capacitor
b) Medium between plates of capacitor
c) Potential difference between plates
d) Distance between plates of capacitor

46. The emf of a battery is equal to its terminal potential difference: — D
a) Under all condition
b) Only when the battery is being charged
c) When a large current is in the battery
d) Only when there is no current in the external circuit

47. A laser must be pumped to achieve — D
a) A metastable state
b) fast response
c) stimulated emission
d) population inversion

48. Your best friend in going on a near light speed trip. When at rest you measure her spaceship to be 100 feet long. Now she is in flight and you are on the earth, and you measure her spacecraft to be — B
a) Exactly 100 feet long
b) less than a 100 feet long
c) more than 100 feet long
d) none of the above

49. What happens to the half life of a radioactive substance as it decays? — A
a) It remains constant
b) it increases
c) it decreases
d) it could do any of these

50. The area of a book having length 1m and breadth 0.5m, in cm^3 is given by — A
a) 5000 b) 5
C) 500 d) 50

51. 2π rad/s is approximately equal to — D

a 30 revolutions b) 40 revolution
c) 50 revolutions d) 60 revolutions

52. The equation of continuity can be derived from — C
a) Law of conservation of energy
b) Law of conservation of momentum
c) Law of conservation of mass
d) Law of conservation of charge

53. Lorentz force is based on — B
a) Dot product
b) cross product
c) both dot and cross product
d) independent of both

54. $\frac{volt}{ampere}\, farad$, expected dimension is — D
a) $M^0 L^0 T^{-1} A^{-2}$ b) $M^1L^1T^{-2} A^{+2}$
c) $M^0L^0T^1A^2$ d) None

55. In Compton scattering from stationary particles the maximum shift in wavelength can be made smaller by using — A
a) Higher frequency radiation
b) More massive particles
c) Lower frequency radiation
d) Less frequency radiation

56. Which of the following system below are not inertial reference frames? — D
a) A person standing still
b) An airplane in mid flight
e) A merry-go-round rotating at constant rate
d) All of the above are IFRs

57. A wire carrying current 10mA experiences a force of 2N in a uniform field. What is the force on it when current rises to 30mA? — C
a) 2N b) 4N
c) 6N d) 8N

58. The efficiency of electric heater is — D
a) 45% b) 60%
c) 75% d) 100%

59. The velocity of disc at the bottom of an inclined plane is independent of — D
a) Mass of disc
b) radius of disc
c) height of inclined plane
d) both a and b

60. Water flows through a lcm diameter pipe with speed of Im/s. what should be the diameter of the nozzle if the water is to emerge at 4m/s? — D
a) 2.1cm b) 1.6cm
c) lcm d) 0.5cm

61. The ratio of P.E and total energy at extreme position in SHM will be equal to — A
a) 1 b)½
c) 1/4 d)zero

62. The speed of sound in air is 334m/s at a pressure P. what will be the speed of sound if the pressure becomes 4P? — B
a) 167m/s b) 334m/s
c) 668m/s d) 1336 m/s

63. In monochromatic red light a blue book wi probably appear to be — C
a) Purple b) green
c) black d) none of the above

64. Two identical heat engines "A" and "B" have their sources at 600k and 400k and their sinks at 300k and 250k respectively. What can you say about their efficiency? — A
a) A is more than B
b) A is less than B
c) both have equal efficiency
d) the date given is not sufficient

65. Two parallel conducting wires placed closer to each other carry current in the opposite direction will — B
a) Attract each other
b) repel each other
c) no effect
d) None of the above

66. If we increase the resistance of coil, the induced emf will — B
a) Increase b) decrease
c) remains same d) none

67. In a capacitive circuit, current and voltage phase relation is — B
a) In phase
b) current leads voltage by 90^0
c) voltage leads current by 90^0
d) None of the above

68. The ability of solids to resist bending is called — D
a) Strength b) hardness
c) toughness d) stiffness

69. Which one is known as antimatter or antiparticle? — D
a) Proton b) electron
c) neutron d) positron

70. Laser light is the result of — C
a) Ordinary emission
b) spontaneous emission
e) stimulated emission
d) all of the above

71. Radioactivity is affected by — D
a) Temperature b) pressure
c) humidity level d) None of the above

72. A car in motion hits and gets embedded in a tree trunk. What is conserved? — B
a) Momentum and K.E
b) Kinetic energy alone
c) neither K.E nor momentum
d) Momentum alone

73. The work done by a magnetic field on a moving charge is — C
a)BqvL b)Bqv/L
c) zero d) positive

74. Four wires meet at a junction. The first carries 4A into junction, the second carries 5A out of the junction and 3rd carries 2A out of the junction. The 4th carries — D
a) 7A out of the junction
b) 7A into the junction
c) 3A out of the junction
d) 3A into the junction

75. A 10 turn conducting loop spins at 60 revolutions per second in a magnetic field of 0.50T, the maximum emf generated is — D
a) 200 π^2r^2 b) 300 π^2r^2
e) $400\pi^2r^2$ d) 600 π^2r^2

76. According to the theory of relativity — D
a) Moving clock runs fast
b) Energy is not conserved in high speed collision
C) The speed of light must be measured relative to the either
d) None of the above are true

77. Which one of the following has the greatest effect in decrease the oscillation frequency of an LC circuit using instead? — D
a) $\frac{L}{2}$ and $\frac{C}{2}$ b) $\frac{L}{2}$ and 2C
c) 2L and $\frac{C}{2}$ d) 2L and 2C

78. The relation between the disintegration constant λ and the half life T of a radioactive substance is — C
a) λ =1/T b)λ = 2/T
c) Λt= ln2 c)λT =ln(½)

79. A small block oscillates back and forth on a smooth concave surface of radius R. the time period of small oscillation is — A
a) $T = 2\pi\sqrt{\frac{R}{g}}$ b) $T = 2\pi\sqrt{\frac{2R}{g}}$
c) $T = 2\pi\sqrt{\frac{R}{2g}}$ d) None of the above

80. The dimension of pressure is — A
a) $ML^{-1}T^{-2}$ b)$ML^{-2}T^{-2}$
c) $[MLT^{-2}$ d) $ML^{-1}T^{-1}$

81. The magnitude of two forces each of them is ION are added together such that the magnitude of their resultants is also ION. then the angle between the forces is — D
a) 30^0 b) 60^0
c) 90^0 d) 120^0

82. Two railway trucks of masses m and 5m move towards each other in opposite direction with speed 3v and v respectively. These trucks collide and stuck together. What is the speed of the truck after collision? — A
a) v/3 b) v/2
c) v d) 5v/4

83. An emf of 16 volts is induced in a coil of inductance 4 H The rate of change of current must be — D
a) 64 A/s b) 32A/s
c) 16 A/s d) 4 A/s

84. In an RLC series phasor, we start drawing the phasor from which quantity? — C
a) Voltage b) resistance
c) impedance d) current

85. What is the average value of sinusoidal voltage that has a peak value of 15 volts? — B
a) OV b) 9.56V
c) 10.6V d) 19.1V

86. Which of the following has the largest kinetic energy? — C
a) 2M and 3V b) 5M and 2V
c) 3M and 4V d) M and V

87. The SI unit of electric charge is — A
a) AS^{-1} b) VS^{-1}
c) A d) S

88. If two charges experience a force of 10N when medium is air. If medium is change whose relative permittivity is 2 then force will be — B
a) 3N b) 5N
c) ION d) 0.2N

89. The time rate of change of linear momentum is — A
a) Force b) tension
c) inertia d) impulse

90. A body moving in a circle of radius Im transverses an angle of 57.3%. The distance covered by the body along circle is — B
a) 1 m b) 57.3m
c) πm d) π/2m.

91. The restoring force in the simple pendulum of mass m is — B
a) mg cosθ b) mg sinθ
c)mg tanθ d) mg

92. if temperature of medium increases by 1C then speed of sound will rise — C
a) 0.61cm/s b) 6.1cm/s
c) 61cm/s d) 61m/s

93. Fringe spacing is a function of (young's double slit Exp) — D
a) Separation between slits
b) Wavelength of light
c) Distance between slits and screen
d) All of the above

94. Which one of the following properties is common between sound and light? — D
a) Nature of sound and light
b) Polarization
c) medium
d) diffraction

95. In isothermal process the internal energy of the system — A
a) Remains constant
b) increases
c) decreases

d) none of the above

96. An isolated charged point particle produced an electric field with magnitude E at point 2m away a point m from the particle the magnitude of the field is — **B**

a) 2E b) 4E
c) E/2 d) E

CHAPTER-1: MEASUREMENT

1.1 Physical Quantities & International System of Units

97. Which expression using SI base units is equivalent to the volt; 2018-Med
a. kg $m^2 s^{-1} A^{-1}$ b. kg m s^{-2} A
c. kg $m^{-2} s^{-1}$ A d. kg $m^2 s^{-3} A^{-1}$

D V=W/q=fd/q=mad/It=mvd/tIt=msd/ttIt= kgmm/ssAs= kg $m^2 /s^3 A^1$= kg $m^2 s^{-3} A^{-1}$

98. What is the circumfrence of the circle whos area is 100π 2018-Eng
a. 10π b. 20π
c. 10 d.290

B Circumfrnce of circle(c)= 2πr and area of circle(a) =πr^2 NOW a=πr^2=100π→r^2=100→r=10 to find C=2πr = 2π10=20π

99. The force of one Newton per meter square is equal to one. 2005 Med:
(a) Bar (b) Atm
(c) Pascal (d) Erg.

C P=F/A

100. Which of following is unit of Pressure? 2013 Med:
(a) Kg m s^{-1} (b) Kg $m^{-1} s^{-2}$
(c) Kg $m^2 s^{-2}$ (d) Kg $m^{-2} s^{-1}$

B Kg $m^{-1} s^{-2}$Hints: $P = \frac{F}{A} = \frac{Kg^{m}/S^2}{m^2} = Kgm^{-1}S^{-2}$

101. If p is a pressure and δ is a density then p/δha units of: 2016 Med
(a) m^2/s^2 (b) N/m^2
(c) Kg/m^2 (d) m^3/Kg

A P = F/A=ma/A= kg. ms^{-2}/m^2 = kg/m s and δha=(m/V)ha= kg. $m.m^2/m^3$ = kg now p/δha= kg/ms /kg =m s

102. Which of the following is closest to a yard: 2016 Med
(a) 0.01 m (b) 0.1 m
(c) 1 m (d) 100 m

C 1 m is closed to year

1.2 Scientific Notation,Error & Uncertainties

103. A student measure current as 0.5A. which of the following correctly expresses the result 2018-Eng
a. 50Ma b. 50MA
c.500mA d. 500MA

C 0.5 A= 0.5 mA/m = $0.5/10^{-3}$ mA= 0.5 x 10^3 mA= 5x 1000 mA=500 mA

104. The prefix "tetra" stands for 2018-Eng
a. 10^6 b. 10^9
c. 10^{-9} d. 10^6

exa →E →10^{18}	**kilo →k→ 10^3**	**milli→ m→ 10^{-3}**
peta →P→ 10^{15}	**hecto →h→ 10^2**	**nano →n→ 10^{-9}**
tera →T →10^{12}	**deka →da→ 10^1**	**pico →p→ 10^{-12}**
giga →G→ 10^9	**deci →d→ 10^{-1}**	**femto →f→ 10^{-15}**
mega→ M→ 10^6	**centi →c→ 10^{-2}**	**atto →a→ 10^{-18}**

Q	Question	Ans	Explanation
105.	What is the ratio of 1 Gm/1μm? 2012 Eng: (a) 10^{-3} (b) 10^{-7} (c) 10^{-18} (d) 10^{15}	**D**	1Gm =Gaga meter = 10^9,1μm = micro meter = 10^{-6} Thus; 1Gm/1μm = $\frac{10^9}{10^{-6}}$ = $10^9 \times 10^6$ = 10^{15})
106.	The prefix 'Pico' stands for: 2014 Med: (a) 10^6 (b) 10^9 (c) 10^{-12} (d) 10^{12}	**C**	Pice = 10^{-12}
107.	9.5×10^{15}m when rounded off 40 is 10^{16} m which is equal to 2011 Eng: (a) Tera meter (b) Atto meter (c) Exa meter (d) Light year	**D**	as Peta = 10^{15} so Light year = 9.5×10^{15} m = peta meter
108.	The measurement of physical quantity may be subject to random errors and to systematic errors. Which statement is correct? 2015 Eng: (a) Random errors are always caused by the person taking the measurement. (b) A systematic error cannot be reduced (c) Random errors can be reduced by taking the average of several measurements (d) A systematic error results in a different reading each time the measurement is taken.	**C**	**Random errors can be reduced by taking average of several measurements**

1.4 Rounding Off Numbers & Significant Figures

Q	Question	Ans	Explanation
109.	The number of significant fiures in the measurement of 5.005x 10^{-5} s is; 2018-Eng a. 2 b. 3 c. 4 d 5	c	The zero between two significant figure is also significant and power is not counted in significant figures.
110.	The scientific notation of a number 0.0023 is expressed as: 2015 Eng A) 2.3×10^{-3} B) 0.023×10^{-2} C)2.3×10^{-4} D) 0.2×10^{3}	A	2.3×10^{-3}. Decimal moved to right after first non zero digit and sign of power will be negative while moving to right
111.	If 7.635 & 4.81 are two significant numbers, their multiplication in significant digit is 2011 Eng: (a) 36.72435 (b) 36.724 (c) 36.72 (d) 36.7	B	Answer should be carried to least significant figure operation i.e. 4.81 which are to be multiplied.
112.	The number of significan figures in 4.0030 is; 2009 Med: (a) Four (b) Five (c) Two (d) Three	B	Zero after decimal to the right are also significant
113.	The number of significant figures in the measurement x = 10.00300 2012 Med: (a) 7 (b) 8 (c) 5 (d) 3	A	Zero after decimal to the right are also significant because it sow least count of measuring instrument
114.	The number of significant figures in the measurement of 5.05×10^{-3} m/s is; 2008 Med: (a) 2 (b) 3 (c) 4 (d) 8	b	Number in powers are in included in significant figures
115.	During the experiment one measured the mass of Mosquito and fount it 1.20×10^{-5} Kg. The numbers of significant figures in this case are: 2014 Med (a) Five (b) One	D	Number in powers are in included in significant figures

(c) Two (d) Three

No.	Question	Ans	Explanation
116.	In a cricket match 500 spectators are counted one by one. How many significant figures will be there in the final result? 2016 Med (a) 0 (b) 1 (c) 2 **(d) 3**	D	If L.C is 100 than 1 significant figure. If L.C is 10 than 2 significant figure. As there are 500 spectators and are counted one by one means L.C is 1 So there will be 3 significant figure

1.3 Precion & Accuracy,Indicating Uncertainty

No.	Question	Ans	Explanation
117.	A value for the acceleratioj of ree fall on earth is iven (10+2) ms^2. Which statement is the most correct 2017-MEd a. the value is accurate but not precise b. the value is both accurate and precise c. the value is neither precise nor accurate d. the value is precise but not accurate	A	Accurate because value is near to 9.8 but not precise because least count is little more.
118.	The maximum error in measurement of mass and length of the sides of the cube are 3% and 2% respectively. The maximum error in the measurement of its density is 2017-Eng a. 3% b. 5% c. 6% d. 9%	d	D=m/V=m/LLL=3/2222=3+2+2+2=9%
119.	In simple electrical circuit the current in a resistor is measured as 2.50+0.05mA. the resistor is marked as having a value of 4.7±2%. if these values where used to calculate the power dissipated in the percentage uncertainty in the value obtained 2017-Med a. 2% b. 4% c. 6% d. 8%	c	P=VI=IRI=I2%I=2+2+2=6% Uncertainty in I=0.05/2.50 x100=2%
120.	The power loss in resistor is culates by formula $P=V^2/R$. the uncertaniuty in V s 3% and in R is 2%. Uncertainty in P is: 2018-MEd a. 4% b. 7% c. 8% d. 11%		$P=V^2/R$=VV/R=3%3%/2%=3+3+2=8%
121.	A quantity x is to be determined by the equation x=P-Q. P is measured as 1.27±0.02 m and Q is measured as 0.83±0.01m. what is percentage uncertainty in x to one significant figures; 2018-MEd a. 0.04% b.2% c. 3% d. 7%	D	
122.	The quantity x is to be determined form the equation x = p-Q.nP is measured as (1.27+ 0.02)m and Q is measured as (0.03 + 0.01)m. What is the percentage uncertainty in x to one significant figure. 2012-150 Eng: (a) 4% (b) 2% (c) 3% (d)7%	B	Hints; x=P-Q=1.27-0.03=1.24 , Error = 0.02+0.01=0.03 Percentage uncertainty= $\frac{\text{Error}}{\text{Measured quantity}}\times 100 = \frac{0.03}{1.24}\times 100 = 2.4 \approx 2$
123.	The density of the steel ball was determined by measuring the mass and diameter. The mass was measured with 1% and diameter 3% of the error. In the calculated density of the steel ball is at most. 2009-61 Med: (a) 2% (b) 4% (c) 8% (d) 10%	D	By formula of density D=m/V ,the error is 1%+3% = 4%
124.	The power loss, P in resistor is calculated using the formula $P = V^2/R$. The uncertainty in the potential difference V is 3% and the uncertainty in the resistance R is 2%, what is the uncertainty in P? 2012-51 Eng: (a) 4% (b) 7% (c) 8% (d) 11%	C	$P = \frac{V^2}{R} = \frac{(3\%)^2}{2\%} = \frac{3\%\times 2}{2\%}$ $= 6\% + 2\% = 8\%$ Note; power is multliped to the error

125. The uncertainty recorded in the radius of a sphere is 1.6%. The uncertainty in the area of that sphere is; 2012-61 Med:
(a) 4.8% (b) 3.2%
(c) 1.6% d) 0.8%

B — Area of sphere = $4\pi r^2$ => Thus uncertainty in area = $(1.6\%)^2$ = 1.6% × 2 = 3.2% (In uncertainty power is multiplied)

---

126. The percentage error in the measurement of mass and speed are 5% or 6% respectively the maximum error in the measurement of K.E is:
2015-07 Med
A) 17% B) 30%
C) 15% D) 90%

A — Maximum Error in K.E = $\frac{1}{2}mv^2$ = $(5\%)(6\%)^2$= (5%) + (6%x2) = 17%

---

127. A precise measurement is one which has; 2010-85 Eng:
(a) Less uncertainty (b) Max precision
(c) Absolute precision (d) None of these

A — Smaller L.C——>More precise measurement. Relative Erro——>More Accurate

1.5 Dimentions

128. The dimesnsional formula for change in momentum is same for: 2018-Med
a. force b. impulse
c. acceleration d. velocity

A — $\Delta P/t=\Delta mv/t=\Delta ma=\Delta F$

---

129. Suppose A=BC, where A has the dimesnsion L/M and C has the dimension L/T. then B has the dimension 2017-Med
a. T/M b. L^2 /TM
c. TM/L^2 d. L^2 T/M

A — A=BC thus B=A/C (putting dimesnsion of both A and C) we get B=$\frac{L/M}{L/T}$ = T/M

---

130. The unit of planks constant is same is that of: 2017-med
a. angular momentum b. work
c. force d. torque

A — L=rp=rmv=rms/t= m kg m/s= kg m^2 /s
E=hf→h=E/f=ET=wt=Fdt=madt=mdvt/t=mdv =mds/t=kg m m /s = kg m^2 /s

---

131. Which one of the following is both unitless and dimentionless 2017-Eng
a. angle b. solid angle
c. mechanical equivalent of heat d. refractive index

A — Angle is ration between two length so it has no unit and no dimension.

---

132. The dimensions of Planck constant are; 2010-Med
a. $[MLT^{-2}]$ b. $[ML^2T^{-1}]$
c. $[MLT^{-3}]$ d. $[ML^2T^{-2}]$

b — E=hf →h=E/f=ET=k.E t= M (L^2/T^2) T= ML^2T^{-1}. Not dimesntion for all types of energy are same

---

133. The Dimension of work are similar to the dimensions of; 2011 Eng:
(a) Impulse (b) Torque
(c) Power (d) Angular momentum.

B — W= Fd and torque = Fr as r and d have same dimensionso work and torwue have also same dimension.

---

134. $ML^{-1}T^{-1}$ are dimensions of; 2011- Med:
(a) Augular Momentum (b) Power
(c) Impulse (d) Viscosity

D — F=6πηrv →η=F/6πrv=F/rv=ma/rv=$\frac{mv/t}{rv}$ = $ML^{-1}T^{-1}$

---

135. The dimensions of energy are the same as those of ; 2007-Med
a . Momentum b. Acceleration
c. Force d. Work

D — Work is ability to do work and its type of energy so it has same dimension.

---

136. The dimensions of the gravitational constant are: 2010-Med:
a. $[M^2L^2T]$ b. $[M^{-1}L^3T^{-2}]$
c. $[M^2L^{-2}T^{-2}]$ d. $[ML^{-2}T^{-1}]$

B — F=gM1M2/R^2→ g = FR^2/M1M2→$MLT^{-2}L^2M^{-2}$ → $M^{-1}L^3T^{-2}$

Q	Question	Ans	Explanation
137.	The dimensions of torque are: 2008,Med, 2010-Eng: a. $[MLT^{-2}]$ b. $[ML^2T^2]$ c. $[MLT^{-1}]$ d. $[ML^2T^{-2}]$	D	Torque = rf = L MLT^{-2} = ML^2T^{-2}
138.	The dimensions of impulse are similar to the dimensions of: 2010-Eng a. Torque b. Work c. Momentum d. Force	C	Impulse = Ft=mv/t xt= mv and momentum =mv
139.	The dimensions of angular acceleration are ; 2007-Med a. $[L^{-1}T^{-1}]$ b. $[LT^{-2}]$ c. $[T^{-2}]$ d. $[L^2T^{-2}]$	C	Angular acceleration = a/r=s/ttr=1/tt= T^{-2}
140.	Planck's constant has the dimension of: 2009-Med a. Energy b. Work c. Linear momentum d. Angular momentum	D	E=hf→h=E/f=Et=Wt =Frt=mart=mvrt/t=mvr = pr = Angular momentum
141.	$M^0L^0T^0$ are the dimension of 2011- Med: (a) Strain (b) Refractive Index (c) Magnification (d) All	D	All of these are rarion of same wuantity so all are dimensionless.
142.	The time rate of change of magnetic flux has the same dimensions as that of: 2012-, Med: A) Current B) Resistance C) Magnetic induction D) Potential difference	D	
143.	Which of the following pairs have the same units and dimensions? 2012-Med: A) Resistance and resistivity B) Conductivity and resistivity C) Electromotive force & potential difference D) Resistivity & temperature coefficient of resistivity	C	Electromotive force & potential differenc both have same dimension
144.	Which one is correct formula for finding the speed, V of ocean waves in terms of the density p of sea water, the accelaration of free fall g, depth, h of the ocean & the wavelength λ? 2012-Eng: (a) v = $\sqrt{g\lambda}$ (b) v = $\sqrt{g/4}$ c) v = $\sqrt{\rho gh}$ (d) v = $\sqrt{g/\rho}$	A	For valid formula dimension of both sides are same; v = $\sqrt{g\lambda}$ = $\sqrt{\frac{m}{s2}\times m}$ = $\sqrt{\frac{m^2}{s^2}}$ = m/s = Velocity.
145.	Suppose A = BC, where A has the dimension L/M and C has the dimension L/T. Then B has the dimension: 2016-Eng (a) T/M (b) L^2/TM (c) TM/L^2 (d) L^2T/M	A	A=BC→ B=$\frac{A}{C}=\frac{L/M}{L/T}=\frac{LT}{ML}=\frac{T}{M}$ =

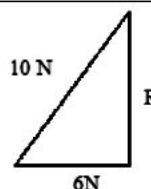
CHAPTER#2: VECTORS & EQUILIBRIUM

2.1 VECTORS:

Q	Question	Ans	Explanation
146.	Which pair contain one vector and one scalar quantity; 2017-Eng a. displacement and acceleration b. force and kinetic energy c. momentum and velocity d. power and speed	**B**	Force is scalar and kinetic energy is vector because force have proper direction while kinetic energy have not

#	Question	Ans	Explanation
147.	The correct representation of the vector $\overline{A}$ in the xy-plane is given. In terms of the rectangular components as: 2008-94 Med; a. $\vec{A} = Ax\,\hat{i} + Ay\,\hat{j}$ b. c. $\vec{A} = A\times\hat{i} + Ay\hat{i}$ d. $\vec{A} = +A\times\hat{i} + Ayi$	**A**	
148.	If $\hat{A}$ is unit vector in the direction of vector $\vec{A}$ than 2009-Med, 2015- Eng (a) $\hat{n} = \frac{\vec{A}}{\lvert A\rvert}$ (b) $\hat{n} = \vec{A}\lvert A\rvert$ (c) $\hat{n} = \hat{n}\bar{A}$ (d) $\hat{n} = \frac{A}{A}$	**A**	$\vec{A} = \lvert A\rvert\hat{A} \Rightarrow \hat{A} = \frac{\vec{A}}{\lvert A\rvert}$
149.	Which one of the following is scalar quantity? 2012-42 Eng. (a) Mass (b) Acceleration (c) Momentum (d) E. Intensity	**A**	
150.	Which one of the following is not a vector quantity? 2012-7 Med: (a) E. F. Intensity (b) G.F Intensity (c) Magnetic Induction (d) Emf	**D**	

2.2 Addition, Subtraction & Multiplication & Products of Vector

#	Question	Ans	Explanation
151.	The magnitude of horizontal component of force is 10N and 6N. the magnitude of its vertical component is 2018-Eng a. 10N b. 4N c.8N d. 12N	c	
152.	Two forces having magnitude 3.5 N and 5.5 N are acting on a body. Which one of the following cannot be resultant measurent 2018-Eng a. 1.5N b. 2.5N c. 4.5N d. 6.5N	c	The resultant of two vectors is in between of their sum and subtraction.the possible resultants are 5.5+3.5 →5.5-3.5 =9 to 2 so 1.5 is not possible.
153.	The vector P makes 120^0 with x-axis and vector Q makes 30^o with y-axis, then their resultant is 2017-Eng a. P+Q b. P-Q c. $\sqrt{P^2 + Q^2}$ d. $\sqrt{P^2 - Q^2}$	C	
154.	If $\lvert\vec{a} + \vec{b}\rvert = \lvert\vec{a} - \vec{b}\rvert$, for two non zero vectors $\vec{a}$ *and* $\vec{b}$, then it holds that 2017-Eng a. $\vec{a}$ *and* $\vec{b}$ perpendicular b. $\vec{a}$ *and* $\vec{b}$ are parallel c. $\vec{a}$ *and* $\vec{b}$ are coplanar d. $\vec{a}$ *and* $\vec{b}$ are non coplananar	A	
155.	The sum of two forces acting at a point is 16N. if the resultant is 8N and its direction is perpendicular to minimum force, then force is 2017-Med a. 6N and 10N b. 8N and 8N c. 4N and 12 N d. 5N and 11N	A	$10^2 = R^2 + 6^2$ $R^2 = 10^2 - 6^2$ R = 8 (triangle: 10 N, R, 6N)
156.	Two vectors $\vec{A}$ and $\vec{B}$ are such that $\vec{A} + \vec{B} = \vec{A} - \vec{B}$ then select the correct statement: 2015-09 Med A) $\vec{A} = 0$ B) $\vec{B} = 0$ C) neither $\vec{A}$ nor $\vec{B}$ is zero D) None of the above	B	
157.	Two forces having magnitudes 3.5N and 5.5N are acting on a body. Which one of the following cannot be the resultant of their possible sum? 2014-Med A) 1.5 N B) 2.5 N C) 4.5 N D) 6.5 N	A	The resultant of two vectors is in between of their sum and subtraction.the possible resultants are 5.5+3.5 →5.5-3.5 =9 to 2 so 1.5 is not possible.

158. If "x" component of a vector is 3N & Y component is 3N, than angle made by the resultant with n-axis is; 2012- Eng:
(a) 45^0 (b) 315^0
(c) 135^0 (d) 225^0

A — $\text{Tan}\theta = {}^{Fy}/_{Fx} = \theta = \text{Tan}^{-1}\,{}^{Fy}/_{Fx} = \text{Tan}^{-1}\,{}^{3}/_{3} = \text{Tan}^{-1}\,1 = 45^{0.}$

---

159. The vectors A and B are such that |A + B| = |A – B|, Then the angle between the two vectors is:2014-; Med
a) 0^o b) 90^o
c) 60^o d) 180^o

B

---

160. The horizontal & vertical component of forces are 10N each. The direction of the resultant force with x-axis. 2011- Eng:
(a) 30^0 (b) 45^0
(c) 60^0 (d) 75

B — $\text{Tan}\Theta = \frac{Fy}{Fx} \rightarrow \theta = Tan^{-1}\frac{Fy}{Fx} = Tan^{-1}\frac{10}{10} = Tan^{-1}1 = 45^0$

---

161. Two forces of 12N and 6N applied simultaneously to a body. The maximum maguitude of their resultant is 2010- Eng:
(a) 24N (b) 30N
(c) 18N (d) 36N

C — $\vec{R}$ is maximum, when = $\theta = 0^0$,→ $\vec{R} = \vec{A} + \vec{B}$ = 12 + 6 = 18N

---

162. The resultant of a 6N force & 8N force acting at right angle to each other is of magnitude. 2006-10 Med;
(a) 14N (b) 2N
(c) 10N (d) 48N

C — $\theta = 90^0$, → cos 90 = 0 then $\vec{R} = \sqrt{(F_1)^2 + F_2^2 + 2f1f2\,cos\theta} = \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100}$ = 10N

---

163. The magnitude of the resultant two forces is F. The magnitude of each force is F. The angle between the forces must be: 2009=Med, 2013- Eng:
(a) 30^0 (b) 60^0
(c) 45^0 (d) 120^0

D — The angle is 120, just remember the answer in this case, this is example in the book, you can see solution in book, just try example and remember answer.

---

164. The magnitude of the resultant of two forces is 2F. If the magnitude of each force is F, than the angle between these forces is: 2011-Med
(a) 0^0 (b) 90^0
(c) 120^0 (d) 180^0

a — When $\theta = 0^0$ than R is maximum or forces are added of thery are in same direction and have zero ange, ⇒$\vec{R}$ → $\vec{F} + \vec{F}$= 2F

---

165. The vectors $\vec{A}$ and $\vec{B}$ are such that; $|\vec{A} + \vec{B}| = |\bar{A} - \bar{B}|$, The angle b/w the two vectors is; 2013-13Med;2012, Med:
(a) 0^0 (b) 60^0
(c) 90^0 (d) 180^0

C — Special case of vectors additioin.

---

166. If $\vec{A} = 2\hat{\imath} + \hat{\jmath} + 2\hat{k}$ then its magnitude is; 2010-, Med:
(a) 9 (b) 5
(c) 3 (d) 1

C — 2,1,2 *are the numbers with x, y and z* $= \sqrt{(2)^2 + (1)^2 + (2)^2} = \sqrt{4+1+4} = \sqrt{9} = \sqrt{(3)^2} = 3$

---

167. Two forces of magnitude 20N & 10N act at a point that which one of the following cannot be their possible sum. 2012- Med:
(a) 30N (b) 10N
(c) 35N (d) 15N

C — The resultant of two vectors is in between of their sum and subtraction.the possible resultants are 20+10→20-10 = 30→10 so 35 is not possible

---

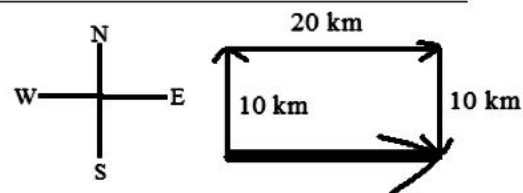
168. Two concurrent forces have a maximum resultant of 45N and minimum result of 5N. What is the magnitude of each these? 2009- Med:
(a) O, 45N (b) 5N, 9N
(c) 20, 25N (d) ON, 45N

C — For maximum their sum is 45 and for minimum their difference is 5 so option c right because its sum is 45 and difference is 5.

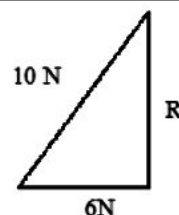
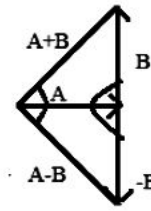
---

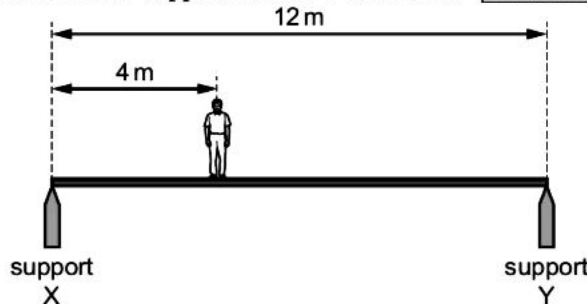
169. Let $\vec{a}$ and $\vec{b}$be any two vectors and θ be the angle between them then |b| cosθ is protection of:
(a)$\vec{b}$ in the direction of $\vec{a}$
(b) $\vec{a}$ in the direction of $\vec{b}$

A — $\vec{b}$ in the direction of $\vec{a}$

	(c) $\vec{b}$ in the direction of x-axis (d) $\vec{a}$ in the direction of y-axis		
170.	The dot product of force & velocity is equal to; 2011-Med: (a) Power (b) Impulse (c) Couple (d) Momentum	A	Power = W=t →Fd/t =Fv
171.	Which of the following is an example of vector product of two vectors? 2011-Med: (a) Linear Momentum (b) Angular Momentum (c) force (d) Electric flux	B	
172.	If the scalar product of two non-zero vectors A & B is zero, the magnitude of their vector product will be 2010-Eng: (a) AB (b) Zero (c) AB Sin ϕ (d) AB Cos θ	a	scalar product is zero when θ = 90 because cos 90 = 0 so from first statement we are told abot angle & A×B = AB sin 90 = AB
173.	If $\vec{A}.\vec{B}=0$ then $\vec{A}\times\vec{B}$ will be equal to: 2011- Eng: **(a) AB $\hat{n}$** (b) Zero (c) AB sin $\theta\,\hat{n}$ (d) AB Cos θ	A	Dot product is zero when angle is 90 and sin 90=1
174.	If each vector have unit magnitude than $\vec{A}.\vec{A}$ is: 2016-Med (a) South **(b) One** (c) North (d) West	B	
175.	A vector of magnitude 20 is added to a vector of magnitude 25. The magnitude of this sum might be: 2016-Med (a) Zero (b) 3 **(c) 12** (d) 47	C	The resultant of two vectors is in between of their sum and subtraction.the possible resultants are 20+25 to 25-20 = 45 → 5 so only 12 is in options
176.	If $\vec{A}\,.\,\vec{B}$ = 1, A = 2, B = 1 then the angle between them is: 2016- Med (a) 30^0 **(b) 60^0** (c) 90^0 (d) 45^0	B	$\vec{A}\,.\,\vec{B}$ = ABcosθ,Cosθ= $\vec{A}\,.\,\vec{B}$/AB==1/2 θ= $\cos^{-1}$(0.5) Thus $\cos^{-1}$(0.5) = 60°
177.	A person walks 10 km north, 20 km east and 10 km south, then the result displacement is: 2016-Eng (a) 10 km north-east (b) 20 km north-east **(c) 20 km east** (d) 20 km west	C	N, W, E, S 20 km 10 km 10 km
178.	The sum of magnitudes of two forces is 16N. the resultant force is 8N and its direction is perpendicular to minimum force, then the forces are: 2016-Eng **(a) 6N & 10N** (b) 8N & 8SN (c) 4N & 12N (d) 2N & 14N	a	$10^2 = R^2 + 6^2$ $R^2 = 10^2 - 6^2$ R = 8

179.

$\vec{A} - \vec{B}$? 2016-Eng

(a) 0^0 (b) 45^0
(c) 60^0 **(d) 90^0**

Answer: d

2.3 Torque and Equilibrium

180. A uniform horizontal footbridge is 12 m long and weighs 4000 N. It rests on two supports X and Y as shown. 2018-MEd

A man of weight 600 N is at a distance of
4 m from support x. What is the upward force on the footbridge from support X?

A) 2200 N B) 2300 N
C) 2400 N D) 2600 N

Answer: **C**

---

181. A body in equilibrium must not have 2018-Eng

a. kinetic energy b. velocity
c. momentum d. acceleration

Answer: **D** — For body in complete equilibrium it must have zero acceleration

---

182. In thee dimensional space two vectors are said to be collinear if they lie ; 2015- Eng

A) along the same line B) along the different lines
C) Above the line D)Below the line

Answer: **A**

---

183. Three vectors of equal magnitude are acting on the three sides of an equilateral triangle. The magnitude of their resultant is. 2011- Med

(a) Zero (b) 3
(c) $\sqrt{3}$ (d) 1.73

Answer: **A**

---

184. The minimum number of unequal forces whose vector sum can be zero are; 2010- Med:

(a) One (b) Two
(c) Three (d) Four

Answer: **C** — **Three unequal forces**

---

185. A body is equilibrium must not have; 2012-150 Med;

(a) K.E (b) Momentum
(c) Velocity (d) Acceleration

Answer: **D**

---

186. The minimum number of equal forces that keep the body in equilibrium are; 2012- 97 Med;

(a) Two (b) Three
(c) Four (d) Five

Answer: **A**

---

187. Two or more vectors are said to be collinear if they are:
2012- 25 Eng:

(a) Intersecting the same line
(b) parallel to the same line
(c) perpendicular to the same line
(d) both a. and c.

Answer: **B** — Two **vectors** are **collinear** if they have the same direction or are parallel or anti-parallel.

188. If three coplanar forces acting on a body keep it in equilibrium, then these forces pass are; 2007- 188 Med;
(a) Concurrent (b) Non concurrent
(c) Parallel (d) Antiparallel

A When two or more forces act upon a body and the lines of action of these forces pass through a common point, the forces are said to be concurrent.

189. The physical quantity which produces angular acceleration in body. 2011-18,2010- 47 Med
(a) Force (b) Centripetal force
(c) Impulse (d) Torque

D

190. The direction of torque is: 2009- 46 Med
a. Parallel to the plane of F and r
b. Perpendicular to the plane of F and r
c. Anti – parallel to the plane of F and r
d. is the same as that of the plane of F and r

B

191. The moment arm of force of 0.6N to produce maximum torque of 0.48 N.m is 2011-23 Eng:
(a) 2.88m (b) 8m
(c) 0.8m (d) 0.288m

C T = r×f, $r = \frac{T}{F} = \frac{0.48}{0.6} = 0.8$m

192. Newton's first law of motion provides: 2011-19 Eng:
(a) 1st condition of equilibrium
(b) 2nd condition of equilibrium
(c) Complete equilibrium
(d) Rotational equilibrium

A

193. The point at which an applied force produces linear motion but no rotatory motion is:
2011-22 Med;2010-24 Eng;
(a) Mid-point (b) Centre of gravity
(c) Optical centre (d) Pole

B

194. Two equal, anti parallel and non concurrent forces that produce only angular acceleration are: 2012- 94 Med;
A) Couple B) Couple arm
C) Collinear forces D) Torque

A

CHAPTER-3: MOTION & FORCES

3.1 velocity, acceration and Newton laws

195. A ball of iron of mass 2 kg is droped from the top of the building. The ball reaches the ground in 10 s. twhat is te velocity in m/s wjem it strikes the ground 2018-Eng
a. 150 b. 99 c. 49 d. 27

b Vf=vi +at→vf=0+9.8 x 10 = 98

196. A man alk for some time with velocity v due east, then he walks for same time with velocity v due north . the average velocity of the man is 2017-med
a. 2v b. $\sqrt{2v}$
c. v d. v/$\sqrt{2}$

C

197. The area under the acceleration time graph represents 2017-Eng
a. displacement b. velocity
c. change in velocity d. distance traavelled

B A=v/t→v=at

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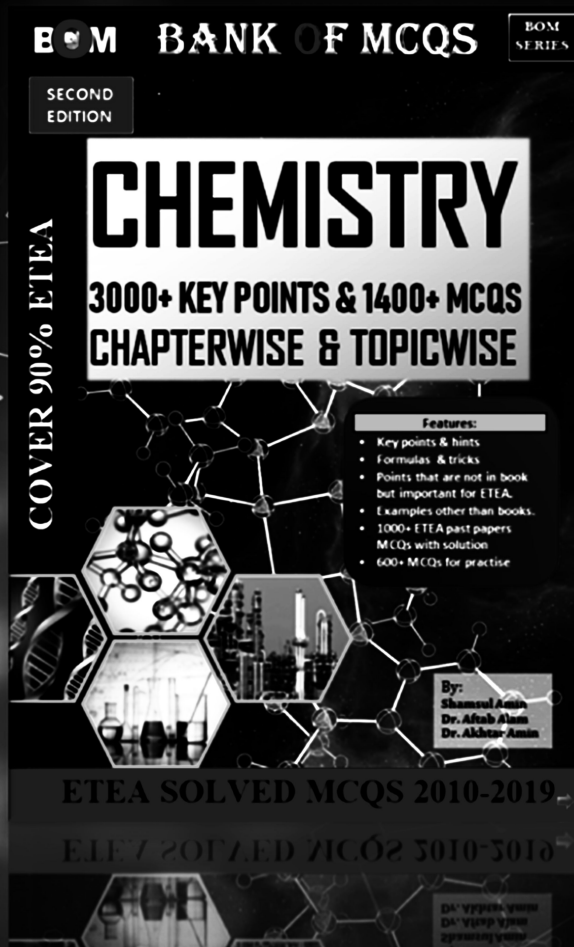
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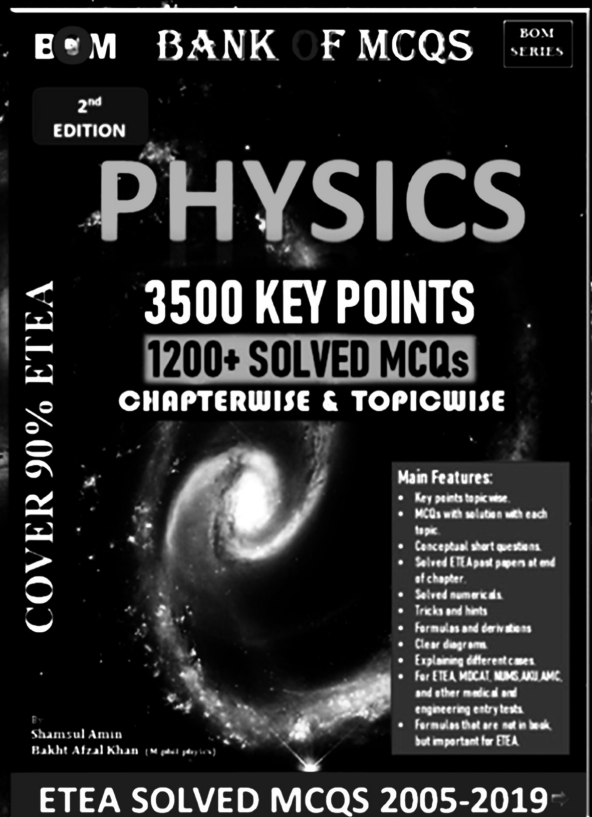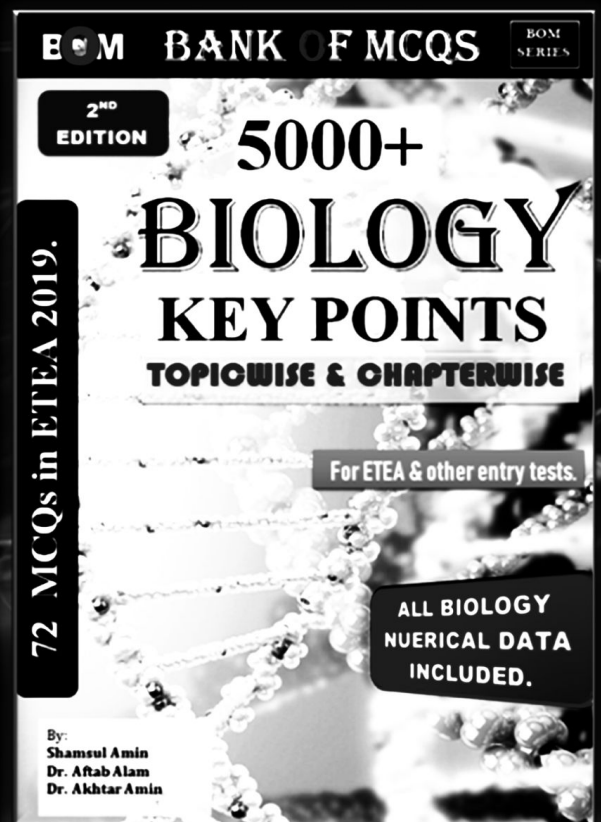
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✓Physics formulas
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Shamsul Amin
Bakht Afzal Khan
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bankofmcqs@gmail.com

No.	Question	Ans	Explanation
198.	A car travels a distance Son a straight road in 2 hours and then returns to the starting point n the next 3 hours. Its average velocity is 2017-Eng a. S/5 b. 2S/5 c. S/2+S/3 d. zero		Car rerurns to its original place so displacement is zero and also velocity becomes zero
199.	When we kick a stone, we get hurt, it happens due to 2017-Eng a. inertia b. velocity c. reaction d. momentum	**C**	Newton third law, to every action there is equal and opposite reaction.
200.	The numerical value of displacement to distance is 2017-Eng a. always less than one b. always equal to one c. always more than one d. equal to or less than one	**D**	Displacement in most cases is less than displacement so displacemtn/distance <1 but displacemt may also equal to distance so displacement/distance = 1
201.	If the 100 gram masshaving 32 ft/sec^2, then its force is 2017-Eng a. 320 lb b. 9.8N c. 320 dyne d. non of these	**D**	M=100g=0.1 kg and a= 32 ft/sec^2=9.8 m/sec^2 so F =9.8x0.1=0.98 N As 1N =10^5 dyne so F = 0.98 x10^5 dyne and lb isunit of mass called pound.
202.	ball is thrown vertically upward with a velocity of 98 m/s. If it takes 10 seconds to reach the highest point, then the acceleration of the ball is; 2011- 25 Med (a) 9.8 m/s^2 (b) 98 0 m/s^2 (c) 98 m/s^2 (d) -9.8 m/s^2	**D**	$a = \frac{vf-vi}{t} = \frac{0-9.8}{10} = \frac{-98}{10} = -9.8$
203.	A ball of mass 5kg is dropped from height of 78.4m, the time takeen by the ball to hit the ground is 2012- 98 Med; (a) 2 sec (b) 4 sec (c) 8 sec (d) 16 sec	**B**	: $t = \sqrt{2h/g} = \sqrt{2(78.4)/9.8} = \sqrt{16} = 4$
204.	On a railway track a driver applies the brakes of the train at a yellow signal, a distance 1 km from red signal, where it stops. The max deceleration of the train is 0.2 m/s^2. Assuming uniform deceleration, what is the maximum safe speed of the train at the yellow signal? 2012- 65 Eng: (a) 20 m/s (b) 40 m/s (c) 200 m/s (d) 400 m/s	**A**	
205.	A racing car accelerates uniformly through their gear changes with the following average speeds: $20ms^{-1}$ for 2.0s, $40ms^{-1}$ for 2.0s and $60ms^{-1}$ for 6.0s. What is the overall average speed of the car? a) $12ms^{-1}$ b) $13.3ms^{-1}$ c) $48ms^{-1}$ d) $40ms^{-1}$	**C**	First we will find S_1,S_2,S_3…..Since $S_1=v_1xt_1$ = 20x2=40m,& S_2= 40x2=60m, & S_3=60x6=360m Thus; Total distance=40+60+360=480m So, Average speed=480/10=**$48ms^{-1}$**
206.	A mass accelerates uniformly when the resultant force acting on it: 2014-146;Med (a) Is zero (b) Is constant but not zero (c) Increases uniformly with respect to time. (d) Is proportional to the displacement of the mass from a fixed point.	**C**	

207. A ball is dropped from the roof of a very tall building. What is its velocity after falling for 5.0s? 2014-177;Med
a) 1.96 m/s b) 9.80m/s
c) 49.0m/s d) 98.0m/s
C Vf =Vi+gt=0+9.8(5)=49

208. The acceleration of free fall on a planet, P is 1/6th of the acceleration of free fall on earth. The mass of a body on planet P is 30 Kg, what is the weight on planet? 2012- 128 Eng
(a) 4.9N (b) 100N
(c) 290N (d) 49N
D g on planet = $\frac{9.8}{6}$, m = 30 Kg, W = m×$\frac{9.8}{6}$ = 30×$\frac{9.8}{6}$ = 30×1.63 = 48.9 = 49N

3.1 Velocity, Acceleration & Newton's Laws of Motion;

209. The acceleration of free fal on the moon is one-sixth of that of earth. On earth it takes time 't' for a stone to fall from rest at distance of 2m. what is the time taken for a stone to fall from rest at 2m distance starting from rest. 2017-medical
a. 6t b. T/6 c. $t\sqrt{6}$ d. $t\sqrt{2}$
C $S = vit+1/2\ at^2$
$S = 1/2\ a\ t^2$
$T = \sqrt{2s}/g$

210. A man walk for sometime with velocity v due to east. Then he walks for same time with velocity v due north. The average velocity of the man. 2017-medical
a. 2v b. $\sqrt{2v}$C c. v d. $v/\sqrt{2}$
C

211. The area under acceleration time graph represents. 2017-eng
a. displacement b. velocity
c. change in velocity d. distance travelled
C

212. A car travels a distance S on a straight road in 2 hours and then returns to the starting point in the next three hours, its average velocity as. 2017-eng
a. S/5 b. 2S/5 c. S/2 + S/3 d. zero
B

213. When we kick a stone, we get hurt. It happens due to : 2017- eng
a. inertia b. velocity
c. reaction d. momentum
C

214. The numerical ratio of displacement to distance is : 2017-eng
a. always less than one b. always equal to one
c. always more than one d. equal or less than one
D

215. If the 100g mass having 32 ft/sec^2 , then its force is : 2017-eng
a. 320 lb b. 9.8 N
c. 320 Dynes d. none of the above
D

216. A ball of iron, mass 1kg, is dropped from the top of the building. The ball reaches the ground in 5s. what is the velocity, in m/s, of the ball when it strikes the ground. 2018-eng
a. 150 m/s b. 99m/s
c. 49 m/s d. 27 m/s
C

217. The symbol "g" represents the acceleration of free fall. Which of these – statements is correct? 2012- 156 Eng
(a) g is gravity
(b) g is the ratio weight/mass
(c) g is the weight of an object
(d) g is reduced by air resistance.
B

218. Bodies which fall freely under the action of gravity is an example of: 2011- 26 Eng:
(a) uniform acceleration (b) variable acceleration
(c) uniform velocity (d) average acceleration
A

219. Newton second law of motion establishes relationship between. 2010-101 Med

a. Force and acceleration b. Mass and force
c. Mass and velocity d. Acceleration and mass

A

---

220. Two blocks of masses 1.0 kg and 3.0 kg placed in contact are acted upon by a forces of 40 N. the acceleration of 1.0 Kg mass will be; 2012-145 Med

(a) 40 m/sec^2 (b) 10 m/sec^2
(c) 30 m/sec^2 (d) 50 m/sec^2

B

$a = \frac{F}{m_1+m_2} = \frac{40}{1+3} = \frac{40}{4} = 10\ m/s^2$

---

221. The property of moving object by virtue of which it exerts force on the object that tries to slop it is: 2011-35 Med

(a) Inertia of the body (b) quantity of motion of body
(c) Acceleration of body (d) All of these

A

---

222. A mass accelerates uniformly when the resultant force acting on it is: 2016-186 Med

(a)Zero
(b) Constant but not zero
(c) Increases uniformly with respect to time
(d) Both (a) & (c)

B

---

223. A stone is thrown upward from the top CA = 59.4m high cliff with an upward velocity component of 19.6m/s. How long is stone in the air? 2016-93 Eng

(a) 4.00 s (b) 5.00 s
(c) 6.00 s (d) 7.00 s

C

---

224. A science museum designs an experiment to show the fall of a feather in a vertical glass vacuum tube. The time of fall from rest is too close to 0.5 s. What length of tube is required? 2016-71 Eng

(a) 1.3 m (b) 2.5 m
(c) 5.0 m (d) 10.0 m

A

3.3 Linear Momentum & Collision

225. Two objects,P and Q have the same momentum.Q has more kinetic energy than P if it: 2016

A) weight more than P B)is moving faster than P
C) weight same as P D) is moving slower than P

B

---

226. A 5 kg stone is released from rest and falls towards the earth after 4 sex. The magnitude of its momentum is;

A)98kgm/s B)78 kgm/s
C)39 kgm/s D) non of these

A

---

227. Two bodies of unequal mass, placed at rest on a frictionless surface, are acted on by equal horizontal forces for equal times. Just after these forces are removed, the body of greater mass will have:

A) greater acceleration
B) smaller momentum
C)greater momentum
D)same momentum as other body

C

---

228. Two bodies of mass 1 and 4 m are moving with equal kinetic energies. The ratio of their linear momentum will be:
2017-97 Eng

A.1:4 B.4:1
C.1.2 D.2:1

C

Hints: $\frac{K.E1}{K.E2} = \frac{m1}{m2}$ and $\frac{p1}{p2} = \sqrt{\frac{m1}{m2}}$

229. The kinetic energy of a body of mass 1 kg and momentum 2 Ns is equal to: **D**
2017-98 Eng
A.1J B.10J
C.5J D.2J

230. Two bodies are dropped from different heights h1 and h2. There ratio of the times taken by them to reach the ground will be: **C**
A.$h_2^2 : h_1^2$ B. $h_2 : h_1^2$
C.$\sqrt{h1} = \sqrt{h2}$ D.Non of the above
Hints; t^2=2h/g

231. A bullets of mass m moving with a velocity v is fired into a large wooden block of mass M. If bullet remains embedded in wooden block, the velocity of the system will be: 2017136 Med **B**
A) $\frac{M}{M+m}$ B) $\frac{m}{M-m}$
C) $\frac{M}{M+m}$ D) $\frac{m}{M-m}$
Firstly wooden block of mass, M has zero initial momentum (Pi) because it is at rest but after fired(strike),bullet moves block along its velocity .Momentum of system(pf) i.e (bullet+wooden block) is conserved as Pi = Pf

232. Two railway trucks of masses m and 3m move towards each other in opposite directions with speeds 2v and v respectively. These trucks collide and stick together. what is the speed of the trucks after the collision? **B**
A)v/4 B)v/2
C)v D)5v/4

233. Two objectives of different masses falling freely from the same heights above the earth's surface will experience the same **B**
A) Change in momentum per unit time.
B) Change in velocity per unit time.
C) Decrease in gravitational potential energy per unit time.
D) Increase in kinetic energy per unit time.

234. The symbol "g" represents the acceleration of free fall. Which of these – statements is correct? 2012- 156 Eng: **B**
(a) g is gravity
(b) g is the ratio weight/mass
(c) g is the weight of an object
(d) g is reduced by air resistance.

235. Bodies which fall freely under the action of gravity is an example of: 2011- 26 Eng: **A**
(a) uniform acceleration (b) variable acceleration
(c) uniform velocity (d) average acceleration

236. Newton second law of motion establishes relationship between. 2010-101 Med **A**
a. Force and acceleration b. Mass and force
c. Mass and velocity d. Acceleration and mass

237. Two blocks of masses 1.0 kg and 3.0 kg placed in contact are acted upon by a forces of 40 N. the acceleration of 1.0 Kg mass will be; 2012-145 Med

(a) 40 m/sec^2 (b) 10 m/sec^2
(c) 30 m/sec^2 (d) 50 m/sec^2

Answer: **B**

$a = \frac{F}{m_1+m_2} = \frac{40}{1+3} = \frac{40}{4} = 10\ m/s^2$

---

238. The property of moving object by virtue of which it exerts force on the object that tries to slop it is: 2011-35 Med

(a) Inertia of the body (b) quantity of motion of body
(c) Acceleration of body (d) All of these

Answer: **A**

---

239. A mass accelerates uniformly when the resultant force acting on it is: 2016-186 Med

(a)Zero
(b) Constant but not zero
(c) Increases uniformly with respect to time
(d) Both (a) & (c)

Answer: **B**

---

240. A stone is thrown upward from the top CA = 59.4m high cliff with an upward velocity component of 19.6m/s. How long is stone in the air?

2016-93 Eng

(a) 4.00 s (b) 5.00 s
(c) 6.00 s (d) 7.00 s

Answer: **C**

---

241. A science museum designs an experiment to show the fall of a feather in a vertical glass vacuum tube. The time of fall from rest is too close to 0.5 s. What length of tube is required? 2016-71 Eng

(a) 1.3 m (b) 2.5 m
(c) 5.0 m (d) 10.0 m

Answer: **A**

---

242. Elastic collision involves 2010-21 Eng:

(a) Loss of Energy
(b) Gain of Energy
(c) No relation b/w energy & elastic collision
(d) No gain, no loss of energy

Answer: **D**

---

243. Which is a statement of the principle of conservation of momentum? 2014-135; Med

(a) Momentum is the product of mass and velocity.
(b) Momentum is conserved only in elastic collisions
(c) Momentum is conserved by all bodies in a collision.
(d) Momentum is conserved providing no external forces act.

Answer: **D**

---

244. Light and heavy bodies have equal kinetic energies. Which one has the greater momentum? 2009-87 Med

a. Heavy body b. Light body
c. Both have same momentum d. None of these

Answer: **A**

---

245. In order to change the momentum of an objective there must be; 2005-78 Med

a. A force applied
b. A change in time
c . A change in distance
d. A change in temperature

Answer: **A**

---

246. The rate of change of momentum of a body falling freely under gravity is equal to its: 2013-136 Med

A) Impulse B) Kinetic energy
C) Power D) weight

Answer: **D**

ΔP/t = F (mg = ΔP/t) $\left\{w = \frac{\Delta P}{t}\right\}$

---

247. A 2N force acts on a mass. If the momentum of the mass changes by 120

Answer: **C**

F = Δp/t, $T = \frac{\Delta p}{F} =$

	Kg m/sec then the force acts for a time of; 2005-49 Med; (a) 8 Sec (b) 30 Sec (c) 60 sec (d) 120 sec		$\frac{120}{2} = 60\ Sec$
248.	The change in momentum of the body is equal to; 2011-Eng: (a) Force (b) Torque (c) Impulse (d) Pressure	**C**	
249.	The motion of the rocket in space in according to law of conservation of; (a) Energy (b) Charge (c) Mass (d) Momentum	**D**	
250.	A constant force, F is applied on a body of mass m for time interval, t b/c of this force, the velocity of body changes from Vi to Vg. Then the changes in momentum during the interval Δt will be; 2005- 24 Med (a) –m (sq^2 – Vi^2) (b) Δt/ma (c) $\frac{m(vf - vi)}{\Delta t}$; $\frac{\Delta p}{t}$ (d) m a/t	**C**	
251.	A particle of mass moving with a velocity, makes head on elastic collision with another particle of mass same with that, and initially at rest. The velocity of the first particle after collision. 2009-124 Med (a) 2V (b) –V (c) +V (d) Zero	**D**	
252.	Newton second is the unit of: 2015-83 Eng; A) Work B) Angular Momentum C) Power D) Linear momentum	**D**	
253.	Conservation of linear momentum is equivalent to: 2015-19 Med A) Newton's 1^{st} law of motion B) Newton's 2^{nd} law of motion C) Newton's 3^{rd} law of motion D) None of the above		
254.	If P is momentum of an object of mass m, than expression P^2/m has same unit as; 2015-18 Med A) Acceleration B) Energy C) Force D) Impulse	**B**	
255.	A particle of mass m has momentum P, its K.E will be: 2015-37 Med A) mP B) P^2m C) P^2/m D) $P^2/2m$	**D**	
	A rifle of mass M is initially at rest but free to recoil. It fires a bullet of mass am and velocity v (relative to the ground). After firing, the velocity of the rifle (relative to the ground) is: 2015-30 Eng A) –mv B) –Mv/m C) –mv/ M D) –v	**C**	According to the law of conservation of momentum; Initial momentum is equal to the final Momentum.i.e Pi= Pf. Thus; if Initial momentum is equal to zero than final momentum must be equal to zero; So, Pf= mv+Mv=0, V=**–mv/ MS**
256.	Two objects, P and Q have the same momentum. Q has more kinetic energy than P if it: 2016-195Med	**B**	**P= √2mK.E**

(a) Weighs more than P
(b) Is moving faster than P
(c) Weighs same as P
(d) Is moving slower than P

257. A 2.5kg stone is released from rest and falls towards Earth after 4.0s, the magnitude of its momentum is: 2016-171 Eng — **A**

(a) 98 kg .m/s (b) 78 kg . m/s
(c) 39 kg .m/s

258. Two bodies of unequal mass, placed at rest on a frictionless surface, are acted on by equal horizontal forces for equal times. Just after these forces are removed, the body of greater mass will have: 2016-161 Eng — **B**

(a)Greater acceleration
(b) Smaller momentum
(c) Greater momentum
(d)Same momentum as other body (d) (0)

3.4 Projectile Motion

259. The range of projectile is the same for two angles which are mutually; 2017-med — **C**

A) Perpendicular B) Supplementary
C) Complementary D) 270^0

260. A cone is 9 cm high and has a vertical angle of 60°, then the diameter of its base is: 2017-Eng — **D**

A) $3\sqrt{3}$ B)$6\sqrt{33}$
C)$9\sqrt{3}$ D)$18\sqrt{3}$

if you are given the height and the vertical angle formed at the cone apex,then multiply the height of the cone with the tangent of angle to get radius and multiply it with 2 to get diameter.

261. A ball is projected upwards. Its acceleration at the highest point is: 2017-Eng — **C**

A. Zero
B. Directed upwards
C. Directed downward
D. Can't be predicted

262. On a planet, a vertically-launched projectile takes 12.5 s to return to its starting position. The projectile gains a maximum height of 170 m. The planet does not have an atmosphere.What is the acceleration of free fall on this planet? 2017-Eng — **B**

a)2.2 m s^{-2} 2 b)8.7 m s^{-2}
c)27 m s^{-2} d)54 m s^{-2}

s vit + 1/2 at^2 → a =(s-vit)2/t^2 → a = (170-0 x 6.25)2/6.25^2= 8.7 ms^{-2}

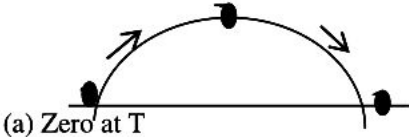
263. A stone is projected vertically upwards from ground at an initial speed of 15 m/s. Air resistance is negligible. What is maximum height reached by stone? 2018-Med — **B**

A) 0.76 m B) 11 m
C) 23 m D) 110 m

2gh=vf^2-vi^2 =>h=v^2/2g=$(15)^2$/2g= 11m

264. A basketball is thrown upward along a parabolic path. What is the ball's acceleration while movingupward? 2018-Med — **C**

A)g, upward B)1/2 g, upward
C) g, downward D) g, upward.

265. A ball is just allowed to fall from the window of a moving train, it will hit the gund following. 2005- 67 Med: — **D**

a) Circular path (b) Hyperbolic
(c) Straight line path (d) Parabolic path

No.	Question	Ans	Explanation
266.	At maximum height the velocity of projectile is; 2012-78Med (a) Zero (b) Minimum (c) Maximum (d) In b/w min & max	**B**	B/c at Max height Vy = 0 & Vx = Vo Cos θ
267.	A projectile is launched at 45^0 to the horizontal with initial K. Energy, E. Assuming air resistance to be negligible, what will be the kinetic energy of the projectile when it reaches its highest point? 2012- 193 Eng: 2014-136; Med (a) 0.71E (b) 0.50 E (c) 0.87E (d) E	**B**	Initial K.E = E, **K.E At highest point** = $\frac{1}{2}mv^2\cos^2\theta$ = (E) $\cos^2 45^{0=}$, E× $(0.7)^2$= .49E = .50E
268.	A projectile is throw horizontally from a 490m high diff with velocity of 10m/s, the time taken by projectile to reach to reach the ground is….. 2007-41 Med (a) 2.5 sec (b) 7.5 sec (c) 5.0 sec (d) 10 sec	**D**	t = $\sqrt{2h/g}$ = $\sqrt{2(490/9.8}$ = $\sqrt{100}$ =10, **5:**
269.	The maximum height, H attained by a projectile projected with initial velocity v = v_0 is given by; 2008-88 Med: (a) H = $V^2 \cos^2\theta/2g$ (b) H = $V^2 \sin^2\theta/2g$ (c) H = $V^2 \cos^2\theta/g$ (d) H = $V^{2\ \cos 2}\theta/g$	**B**	
270.	The horizontal range of the projector is; 2009-30 Med: (a) $R = \frac{Vo^2}{g}\ Sin\ \theta\ Cos\ \theta$ (b) $R = \frac{V_1{}^2}{2g}\ Sin\ \theta$ (c)$R = \frac{V^2}{g}\ Cos\ \theta\ (2\theta)$ (d) $R = \frac{V_1{}^2}{g}\ Sin\ 2\theta$	**D**	
271.	The range of proejctile is the same for two angles which are mutually (a) Orthogonal (b) Supplementary (c) Complementary (d) Sum is 45^0	**C**	When Angles θ& (90 - θ) are mutually complementary, Ranges for angles 30^0& 60^0 or 20^0& 70^0 etc. are same
272.	A bomber drops a bomb, when it is vertically above the target. It misses the target b/c of: 2011- 32 Med: (a) Vertical component of the velocity of bomber (b) force of gravity (c) Acceleration of bomber (d) Horizontal component of the velocity of bomber	**D**	
273.	To improve the jumping record a long jumper should jump at an angle; 2010- 22 Med (a) 30^0 (b) 45^0 (c) 60^0 (d) 90^0	**B**	
274.	The span of broad jump depends upon; 2010-49 Eng: (a) Mass of jumper (b) vision of jumper (c) Angle of projection of jumper (d) Height of jumped	**C**	R = $\frac{v_0^2 sin\ 2\theta}{g}$ = Rmax = $\frac{v_o^2}{g}$ = [θ = 45^0]
275.	A hunter aiming a bird in tree should aim; 2012-65Med (a) A little above the bird (b) A little belo (c) Exactly at the bird (d) Very high	**A**	
276.	A person throws a ball vertically upward while standing in a train moving with uniform velocity. The ball will fall. 2007- 148, 2011-29 Eng: (a) In his hand (b) Behind him (c) In from of him (d) Beside him	**A**	
277.	A man throws a ball vertically upward in a compartment of an	**C**	

"accelerated" train. The ball will fall 2011-28 Med
(a) In font of him (b) In his land
(c) Behind him (d) beside him

278. A missile is fired with a speed of 98 m/see at 300 with horizontal. The missile is airborne for 2011-33 Med
(a) 10 sec (b) 20 sec
(c) 30 sec (d) 40sec
A
T = 2Vθ Sinθ/g = $\frac{2\times98\times\sin 30^0}{9.8} = \frac{2\times98\times0.5}{9.8} = 10,$

279. In the absence of air resistance, a stone is thrown from P and follows a parabolic path in which the highest point reached is "T". The point reaches point Q just before landing. The vertical component of acceleration of stone is 2013-08 Eng:
(a) Zero at T
(b) larger at T than at Q
(c) Larger at Q at than T
(d) The same at Q as at "Tb\
d
The vertical component of acceleration is "g" which is same during the projectile motion.

280. At what angle should a projectile be fired in order for its range to be at maximum? 2014-199;Eng;
(a) 30^o (b) 45^o
(c) 90^o (d) 60^o
B

281. A shot is fired at an angle of 60^o to the horizontal with kinetic energy E. if air resistance is ignored, the kinetic energy at the top of the trajectory is: 2014-194;Med
a) Zero b) E/8
c) E/4 d) E/2
C

282. A basketball is thrown upward along a parabollic path. What is the ball's acceleratio0n at its highest point? 2014-43;Med
(a) 0 (b) 1/2g, horizontally
(c) g, upward (d) g, downward
A

283. When an object slides at const speed down an inclined plane, the co-efficient of friction may be approximately 2005- Med
(a) Sin θ (b) Cos θ
(c) Tan θ (d) Cot θ
A

284. When a body moves against the force of friction on a horizontal plane, the work zone by the body is; 2010-80 Med
(a) Negative (b) Positive
(c) Zero (d) Max & positive
A

285. A helicopter of mass 3.0×10^3 Kg rises vertically with a constant speed of 2m/s, what resultant force acts on the helicopter? 2015-37 Eng
A) Zero B) 3×10^4 N downwards
C) 4.5N upwards D) 7.5×10^4 N upwards
A
As the magnitude and direction of velocity is constant hence n et force is equal to zero.

286. The velocity of projectile equal to its initial velocity added to: 2015-37 Eng
A) A constant horizontal velocity
B) A constant vertical velocity
C)A constantly increasing horizontally
D) A constantly increasing downward vertically
A

287. Two projectiles are in flight at the same time. The acceleration of one relative to othe 2015-28 Med — **D**

A) Always 9.8 m-s^{-2}
B) Can be horizontal
C) Can be as large as 19.8 m-s^{-2}
D) Is zero

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288. A stone thrown horizontally from the top of a tall building follows a path that is: 2015-119 Eng — **D**

A) Circular
B) Made of two straight line segments
C) Hyperbolic
D) Parabolic

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289. Two projectiles are in flight at the same time. The acceleration of one relative to the other: 2016-11 Med — **D**

(a) Is always 9.8 m/s^2
(b) Can be as large as 19.8 m/s^2
(c) Can be horizontal
(d) Is zero

Individualy it is always 9.8 m/s^2 and acceleration of one relative to the other is zero.

CHAPTER-4: WORK & ENERGY

4.1 Work & Power;

290. When a force retards the motion of a body, the work done is: 2017-Eng — **B**

A.Zero
B.Negative
C.Positive
D.+ve or-ve depending upon magnitude of force and displacement

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291. The product of pressure and volume has the same SI base units as; 2017-Eng — **A**

A. Energy B.Force
C.Power D.Heat Capacity

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292. When a body moves against the force of friction on a horizontal plane, the work zone by the body is; 2017-Eng — **A**

A) negative B) positive
C) zero D) max and positive

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293. An engine pumps out 40 kg of water in second. The water comes out of vertically upward with a velocity of 3 ms the power of engine in kilowatt is; 2018-med — **A**

A.1.2 kW B. 12 kW
C.120 kW D. 1200 kW

P =FV = mgV = 40x10x3=-1200= 1.2kW

---

294. Two boys weighting in the ratio 4:5 goes up stair taking time in the ratio 5:4. The ratio of their power is;2018-med — **B**

A. 1 B. 1625
C. 25/16 D. 4/5

P1/P2 = $\frac{m1gh/t1}{m2gh/t2} = \frac{m1/t1}{m2/t2} = \frac{4/5}{5/4} = \frac{4}{5} \times \frac{4}{5}$ = 16/25

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295. A man has a mass of 80 kg. He ties himself to one end of a rope which passes over a single fixed pulley .He pulls on the other end of the rope to lift himself up at an average speed of 50 cm/s. What is the average useful power at which he is — **B**

P =W/t= F.S/t=F.v =mg.v = 80x9.8x0.5=0.392 kW =0.39kW

working? 2018-med
a) 40 W b)0.39 kW
c) 4.0 kW D)39 kW

296.	A steam turbine is used to drive a generator. The input power to the turbine is P_1 and the output power is P_o. the power loss in the turbine is P_a shown below. What is the efficiency of the turbine? 2018-med A) $\frac{P1}{Po}$ B) $\frac{P1}{Po}$ C) $\frac{PL}{P1}$ D) $\frac{Po}{P1}$	**D**	
297.	The total energy input E_{inp} n a process is partly transferred to useful energy output U, and partly to energy that is wasted W. what is the efficiency of the process? 2018med A) (U/W) x 100% B)(W/E_{in}) x 100% C)U/E_{in}) x 100% D)(U+W) Ein x 100%	**C**	
298.	A man carries a 1 Kg body 10m horizontally on a level ground. The work zone by the man is; 2008-103 Med (a) 10J (b) 1 J (c) 0 J (d) 5J	**C**	As force, F he exerts on body and the displacement $\vec{S}$ are mutually Perpendicular, So Cos 90^0 = 0 work = FS Cos θ = 0
299.	A 2 kg object is moving at 3^n/S. A 10 N force is appli3ed in the direction of motion & then removed after the object has moved 5m. The work zone by the force is. 2005-64 Med (a) 50J (b) 40 J (c) 110 J (d) 100J	**A**	F = 10N, S = 5m w = FS = 5 × 10 = 50 J
300.	If work is done at a rate of 240 watt x min by a machine. Its power is; (a) 240 watt (b) 14400 watt (c) 4 watt (d) 120 watt	**A**	Power = $\frac{work}{time} = \frac{240\ watt \times min}{60} = \frac{240 \times 60}{60} = 240\ watt$
301.	The heat energy dissipated by 40 watt also in one hour is ….. 2010-138 Eng: (a) 1440 J (b) 14400 J (c) 144000 J (d) 1440,000 J	**C**	W= P × t P= 40 watt t = 60 x 60 = 3600 sec W= P × t = 40 ×3600 = 144000 Joule
302.	If a machine does 550 foot pound work in one second its power will be; 2010-27 Eng: (a) 550 watt (b) 746 watt (c) 746 horse power (d) 550 horse power	**B**	1 horse power = 746 watt = 550 foot pound/sec
303.	A body of mass "m" moves at coust: speed "v" for a distance "s" against a constant force, F. What is the power required to sustain this motion? 2013-33 Med (a) F.V (b) ½ mv^2 (c) ½ FS (d) F.S	**A**	
304.	An object of mass 1 g is whirled in a horizontal circle of radius 0.5m at a constant speed of 2m/s. The work done on the object during one revolution is: 2016-178 Med **(a) 0** (b) 1 J (c) 2 J (d) 4 J	**A**	Because Work done along a closed path is zero.

Energy, Escape Velocity & Conservation of Energy

305.	A parachutist is falling constant terminal velocity. Which	**B**	the parachute is falling with

	statement is not correct? 2017-med A. Gravitational potential energy is converted into kinetic energy of the air B. Gravitational potential energy is converted into kinetic energy of the parachutist. C. Gravitational potential energy is converted into thermal energy of the air. D. Gravitational potential energy is converted into thermal energy of the parachutist.		constant terminal velocity. Means its velocity remain the same. As K.E=1/2mv,It means K.E remain the same. Option B is correct. i. The gravitational potential energy is not converting into K.E of the Parachute
306.	If the momentum of a body decreases by 20% the percentage decrease in K.E will be: 2018-eng A)44% B)36% C)28% D)20%	**B**	
307.	The gravitational field strength on the surface of the Earth is g. the gravitational field strength on the surface of a planet of thrice the radius and the same density is: 2018-eng A)4 g B)6 g C)3 g D)g/9	**C**	g α r,
308.	Two bodies with kinetic energies in the ratio of 4:1 are moving with equal linear momentum. The ratio of their masses is; 2018-eng A)1:2 B) 1:1 C) 4:1 D)1: 4	**D**	
309.	A 6.0-kg block is released from rest 80m above the ground. When it has fallen 60m its K.E is approximately: 2015-Med A) 4800 J B) 3500 J C) 1200 J D) 120 J	**B**	According to work energy-principleW = K.E, $=> mgh = K.E =$ 6×9.8×60=3528J i.e approximately 3500 J
310.	A light and a heavy body have equal kinetic energies, which one have greater momentum? 2009-87 Med,2015-105Eng A)The light body B) The heavy body C)Both have equal momentum D) Not possible to say anything	**B**	The body which has greater mass has greater momentum because; K.E= P^2/2m & P^2 = 2m(K.E)=$\sqrt{2m(K.E)}$ As; P∝ m, For the same K.E the body which has greater mass has greater momentum
311.	Resistive forces are; 2010-161 Med (a) Non conservative (b) conservative (c) Both (d) None	**A**	
312.	Which of the following is conservative filed; 2007 Med (a) Gravitational field (b) electric field (c) Magnetic field (d) All	**D**	
313.	A force of 6N acts horizontally on a stationary mass of 2 kag for 4 sec. The K.E in joule is;2012-162 Med (a) 12 (b)144 (c) 72 (d) 48	**B**	K.E = P^2/2m = $\frac{(F\times t)^2}{2m} = \frac{(6\times 4)^2}{2\times 2} = \frac{(24)^2}{4} = \frac{576}{4} = 144$
314.	The centripetal force acting on a body rotating in a circle of radius "r" is F. If the body moves in a circle of radius half of the initial value keeping other quantities const: than the %age change in the centripetal force is; 2012-113 Med (a) 300% (b) 100% (c) 200% (d) 200%		
315.	If the mass of the body is made three times and the velocity becomes double then the kinetic energy will increase: 2011-46 Eng:	**B**	K.E = $\frac{1}{2}mv^2$: K.E ∝ m & K.E ∝ v^2

(a) 6 times (b) 12 times
(c) 24 times (d) 18 times

316.	If the velocity of a body becomes half, the kinetic energy of the body will become: 2011-114 Med (a) On fourth (b) Double (c) Four times (d) Half	**A**	K.E ∝ v^2→ K.E = $\left(\frac{1}{2}\right)^2 = \frac{1}{4}$ (one fourth)
317.	A car of mass 1000 kg first travels forwards at $25m/s^2$ and then backwards at $5m/s^{-1}$. what is the change in the kinetic energy of the car? 2012-45 Eng: (a) 200kj (b) 300kj (c) 325kj (d) 450 kj	**B**	Forward K.E – Backward K.E
318.	Two bodies with masses m_1 and m_2 have equal kinetic energies. If M_1 and M_2 are their respective momentum then the ration between M_1 and M_2 is: 2009-71 Med (a) $m^1 : m^2$ (b) $\sqrt{\frac{m_1}{m_2}}$ (c) $m_1^2 : m_2^2$ (d) $\sqrt{m_1} : \sqrt{m_2}$	**B**	For two bodies having equal momentum: = $\frac{K.E_1}{K.E_2} = \frac{m_2}{m_1}$ Hints: For two bodies having equal K.E = $\frac{p_2}{p_2} = \sqrt{\frac{m_1}{m_2}}$
319.	If the speed at which a car is traveling is tripled, by what factor does its kinetic energy increase? 2013-192 Eng: (a) ½ (b) 3 (c) 6 (d) 9	**D**	K.E ∝ V^2
320.	If the momentum of a body decreases by 20% the percentage decrease in K.E will be: 2013-83 Med (a) 44% **(b) 36%** (c) 28% (d) 20%	**B**	K.E = $\frac{P^2}{2m} = \frac{P^2}{2m}(Pf - pi) = \frac{p^2}{2^m}$ $(0.8)^2 - (1)^2 = 0.36$, = 36%
321.	The gravitational potential energy per unit mass is called; (a) Gravitational potential (b) Absolute potential energy (c) Potential energy (d) Potential hill	**A**	
322.	**14:** The escape velocity from the earth gravitational field depends upon: 2011-42 Med: (a) Rotation of earth (b) Mass of body (c) Radius of earth (d) Mass of earth	**C**	
323.	The escape velocity for a ball of mass 0.25 kgwill be: 2010-31 Eng: (a) 44km sec^{-1} (b) 11km sec^{-1} (c) 2.75m sec^{-1} (d) 0.25m sec^{-1}	**B**	

CHAPTER-5:ROTATIONAL & CIRCULAR MOTION

5.1 Angular Motion, Velocity & Acceleration

324. The angular velocity of a second hand in watch is: **2017-Eng** **A**
a)π/30 B)2π
C)π D)60/π

325. A fly wheel rotates at a constant speed of 3000 rpm(rev/min). The angle described by the shaft in radian in one second is: 2017-Eng **C**

A.2π B.30π
C.100π D.3000π

326. The minute hand of a large clock is 3.0m long, what is its mean angular speed? **2018-Eng** **B**

A)1.4×10^{-4} rad/ s
B)1.7×10^{-3} rad /s
C)5.2×10^{-4} rad/ s
D)3.0×10^{-1} rad /s

W = 2πrad/time =2x3.14 rad/3600sec = = 1.7x 10^{-4}rad/sec

327. The angular velocity for daily rotation of the earth is: 2015-18: Eng **C**

(a) $\frac{\pi}{3}$ $radian\ hr^{-1}$ (b) $\frac{\pi}{6}$ $radian\ hr^{-1}$
(c) $\frac{\pi}{12}$ $radian\ hr^{-1}$ (d) $12\pi\ radian\ hr^{-1}$

$\omega = \frac{Distance\ covered}{time} = \frac{2\pi\ radian}{24}$, ω (earth) = $\frac{\pi}{12}$ rad/sec

328. The minute hand of large clock is 3.0 in long. What is its mean augular speed? 2013-18: Eng: **B**

(a) 1.4×10^{-4}rad/sec (b) 1.7×10^{-3}red.sec
(c) 5.2×10^{-3} rad/sec (d) 3.0×10^{-1} rad/sec

W = $\frac{2\pi\ rad}{time} = \frac{2\times3.14}{3600}\frac{rad}{sec}$ = 1.7×10^{-3} rad/sec,

329. When a body moves in a circle the angle between its linear velocity and angular velocity is always: 2010 Med **A**

(a) 0^0 (b) 180^0
(c) 360^0 **(d) 90^0**

330. A wheel starts from rest and has an angular acceleration of 4.0 rad/s^2. When it has made 10 rev its angular velocity is: 2016-142 Med **D**

(a) 16 rad/s **(b) 22 rad/s**
(c) 32 rad/s (d) 250 rad/s

Equation of motion
ωf - ωi= 2αθ Thus; ωf = √2αθ As θ = 10 rev
As; 1rev= =2πrad So, 10rev= =20πrad =20x3.14xrad=63.2rad
ωf = √2x4x63.2= **22 rad/s**

331. Angle that a body traverses at the centre of a circle in two turns is: 2016-164 Med **B**

(a) 4πRads (b) 720^0
(c) 12.6 Rads **(d) All of the above**

1 turn=2πRads so 2 turn = 4πRads
1 revolution (turn) = 360^0 Thus 2 turns= 720^0
4πRads =4x3.14xRads=12.6 Rads

332. A child, riding on a large merry-go-round, travels a distance of 3000m in a circle of diameter 40m. the total angle through which she revolves is: 2016-196 Med **D**

(a) 50 rad (b) 75 rad
(c) 150 rad (d) 314 rad

s=rθ, As r =d/2=40/2=2 & s=3000
θ=s/r =3000/20=150rad

333. The angular speed of the minute hand of a watch is: 2016-171 Eng **D**

(a) (60/π)m/s (b) (1800/π) m/s
(c) (π) m/s **(d) (π/1800) m/s**

Centripetal Force,acceleration

334. A centripetal force Facts on a body moving with angular speed w. If the angular speed is tripled, then the magnitude of centripetal force becomes; 2017-Eng **B**

A.8F B.9F
C.3F D.4F

335. The unit of gravitational potential is: 2017-Eng — **B**
A.Joule. B.Joule / kilogram
C.Joule Kilogram D.Kilogram

336. A circular disc of mass M and radius R is rotating about its axis with uniform speed v. Its kinetics energy is: 2017-med — **B**
A.Mv^2 B.½ Mv2
C) ½ Mv^2
D. 1/8 Mv2

337. An object travels at constant speed around a circle of radius 1.0 m in 1.0s. what is the magnitude of its acceleration? 2018-eng — **D**
A) Zero B) 1.0 ms
C) $2\pi\ ms^{-2}$ D) $4\pi^2\ ms^{-2}$

338. A particle is moving in a circle of radius r with constant angular speed ω. Its acceleration, directed towards the center of the circle is: 2008-48: Med — **C**
(a) $\frac{\omega}{r}$ (b) $\frac{\omega^2}{r}$
(c) $\omega^2 r$ (d) ωr^2

Centripetal **acceleration** is given by : $a_R = v^2/r$, $\omega = \frac{v}{r}$

339. The vectoral form of centripetal force is; 2007-105 Med: — **C**
(a) $\overrightarrow{F_C} = \frac{mv^2}{r}$ (b) $\overrightarrow{F_C} = \frac{mv^2}{r}\vec{r}$
(c) $\overrightarrow{F_C} = \frac{mv^2}{r^2}\vec{r}$ (d) $\overrightarrow{F_C} = \frac{mv^2}{r^2}\hat{r}$

340. The centripetal acceleration of a car traveling at constant speed around a frictionless circular racetrack: 2013-155 Eng: — **B**
(a) Is zero
(b) Has constant magnitude but varying direction
(c) Has constant direction but varying magnitude
(d) Has varying magnitude and direction

341. Which of the following type of force can do no work? 2010-30 Eng: — **D**
(a) Elastic force (b) Frictional force
(c) Gravitational force (d) Centripetal force

342. A body is moving in a circle of radius (r) with a variable speed, the acceleration of the body is: 2015-29Med — **A**
A) Centripetal acceleration B) Tangential acceleration
C) angular acceleration D) All of the above

When a body moves in a circular path than its speed is constant but direction is changing due to which acceleration is produced and this acceleration is called Centripetal acceleration.

343. An object moves in a circle. If the mass is tripled, the speed halved, and the radius unchanged, then the magnitude of the centripetal force must be multiplied by a factor of: 2016-163 Eng — **B**
(a) 3/2 **(b) 3/4**
(c) 9/4 (d) 6

Torque, Moment of Inertia & Angular Momentum

344. The angular momentum of a wheel changes from 2L to 5L in 3 seconds. The magnitude of the torqueacting on it is: 2017-eng — **D**
a)L/5 B)L/3
C)L/2 D)L

345. Angular momentum has the same units as: 2017-eng — **A**
A. Impulse X distance
B. Linear momentum x time

C. Work x frequency
D. Power x time

No.	Question	Ans	Explanation
346.	For a body moving with constant speed in a horizontal circle, which of the following remains constant: 2017-eng A. Velocity B. Centripetal force C. Acceleration D. Kinetic Energy	D	
347.	If a gymnast sitting on a rotating stool with his arms outstretched, suddenly lowers his hands, 2017-eng A.The angular velocity decrease B.His moment of inertia decreases C.The angular velocity stays constant D.The angular momentum increases	b	
348.	A ring and a disc have same mass and same radius. If we denote the moment of inertia of disc by l_d and that of ring by 1_r then: 2017-eng A.$l_r > I_d$ B. $l_r < I_d$ C. $l_r = I_d$ D. $l_r = 2I_d$	D	
349.	Moment of inertia of an object does not depend upon: 2017-Med A. Mass of object B. Mass of distribution C. Angular velocity D. Axis of rotation	C	
350.	A girl sitting on a spinning bar stool with her legs folded, suddenly put spreads them. Her angular velocity will: 2018-eng A)Decrease B)Increase C)Remain the same D)First increase and then decrease.	A	
351.	The rotational analogue of mass in linear motion is: 2015-38 Med A) Torque B) Weight C) Moment of inertia D) Angular momentum	C	
352.	When a mass is rotating in a plane about a fixed point, its angular momentum is directed along; 2015-149 Eng A) Radius B) Tangent to orbit C) A line perpendicular to plane of rotation D) None of the above.	C	As we know that; Angular Momentum=$\vec{L} = \vec{r} \times \vec{p} = \vec{r} \times mv$ **Hence;** The direction of angular momentum is perpendicular to the plane made by the moment arm and momentum.
353.	If the mass of a moving body is doubled, the inertia of the body will be: 2013-188 Eng: (a) Half as great as its original value (b) Four times s great as its original value (c) Unchanged from its original value (d) Twice as great as its original value	D	$I = mr^2$ ($I \propto m$)
354.	A particle, held by a string whose other end is attached to a fixed point C, moves in a circle on a horizontal frictionless surface. If string is cut, angular momentum of the particle about point: C. 2016-136 Med (a) Increases (b) Decreases **(c) Does not change** (d) Changes direction but not magnitude	C	
355.	The rotational inertia of a disk about its axis is 0.70 Kg. m2. When a 2.0-kg weight is added to itsrim, 0.40m from the axis, the rotational inertia becomes: 2016-138 Med (a) 0.38 Kg – m^2 (b) 0.54 kg – m^2 **(c) 0.86 kg – m^2** (d) 1.0 kg – m^2	C	

Artificial Satellite,Orbital Velocity &Geo-Stationary Orbits

356. If a sphere is rolling, the ratio of its rotational energy to total energy is given by: 2017-eng
A.7:10 B. 2:5
C. 01:7 D.2:7
D

357. Two particles having masses M and m are moving in a circular path having radiuses R and r respectively. If their time periods are same, then the ratio of their angular velocity will be: 2017-eng
A) r/R B)R/r
C) 1 D) $\sqrt{\frac{R}{r}}$
C

358. The orbital velocity 'v' and the radius 'T' of the satellite are related by: 2017-eng
A.v α r B. v α $1/r^2$
C. v α 1/r D. v α $1/\sqrt{r}$
D

359. Planets travel in _________ paths. 2017-eng
A.Circular B.Parabolic
C.Elliptical D.Hyperbolic
C

360. Satellites revolve around the earth in a circular orbit. What is the relationship between the radii r of their orbits and the orbital speeds? 2018-eng
A) V α r^2 B V α r
C) V^2 α 1/r D) V α 1/r
C

361. The orbital speed of the satellite in an orbit depends: 2011-56Eng:
(a) $\sqrt{\frac{GM}{R_e}}$ (b) $\sqrt{\frac{GM_e}{R}}$
(c) $\sqrt{\frac{GM_e}{R^2}}$ (d) $\sqrt{\frac{GM_e}{h}}$
B

362. The orbital velocity of satellite in an orbit around the earth depends upon, 2008-Eng:
(a) value of 'g' (b) radius of earth
(c) radius of the orbit (d) all of these
C $V = \sqrt{\frac{GMe}{r}}$ & $V \propto \frac{1}{\sqrt{r}}$

363. A Satellites is revolve around the earth in a circular orbit. What is the relationship between the raider f their orbits and their speeds?2013-179 Med
(a) $V \propto r^2$ (b) $V \propto r$
(c) $V^2 \propto 1/r$ (d) $V \propto 1/r^2$
C $v \propto \frac{1}{\sqrt{r}}$ & $V^2 \propto 1/r$,

364. On the ground the gravitational force on a satellite is W.What is the gravitational force on the satellite when at a height R/50, where R is the radius of the earth? 2013-05 Med
(a) 1.04W (b) 1.02W
(c) 0.50W (d)0.96W
D $W = \frac{GMem}{R^2}$ & $W' = \frac{GMem}{(Re+\frac{Re}{50})^2} =$ 0.96W,

365. The time period of communication satellites is 2009-94 Med
(a) 1 hours (b) 2 Hour
(c) 12 Hour (d) 24 hour
D

Real & Apparent Weight,Weightlessness in Satellite & Artificial Gravity

No.	Question	Ans	Explanation
366.	A man of mass 90 kg is standing in an elevator. whose cable broke suddenly. If the elevator falls freely the force exerted by the floor on the man is; 2017-Eng A.Zero B.90x9.8 N C.90N D.-90N	A	
367.	A body of mass 10 kg is hanging from a spring inside a lift. If the lift falls with an acceleration $10ms^{-2}$ then what will; 2017-med A.Zero B.2.5 kg C.5 kg D.10 kg	A	
368.	A body of mass 1kg is suspended from a balance in the elevator which is accelerating downward with an acceleration of 4 ms^{-2}, the reading of the balance will be: 2018-Eng A)9.8N B)13.8N C)5.8N D)Zero	A	
369.	The paratrooper of mass 80 kg descends vertically at a constant velocity of 3 m/s taking the acceleration of free fall as 10 ms^{-2}. Find out what is the net force acting on him? 2018-Eng A)Zero B)8.00 N upward C)8.00 N downward D)240 N downward	C	
370.	A man stands in a lift that is accelerating vertically downwards. Which statement describes the force exerted by the man on the floor? 2018-med A. It is equal to the weight of man. B)It is greater than the force exerted by floor on the man C.lt is less than the force exerted by the floor on the man. D)It is less than the weight of man.		As the velocity is constant hence acceleration is zero, so the net force on him is equal to zero, as the is coming with constant terminal velocity.
371.	A satellite is orbiting close to the surface of the earth, its speed is: 2015-47 Med A) $\sqrt{2gR}$ B) $\sqrt{Rg}$ C) Rg/2 D) Rg	B	Fc=Fg & $\frac{mv^2}{R} = mg$ Thus; v= $\sqrt{Rg}$
372.	A parachute of mass 80 kg descends vertically at a constant velocity of 3.0 m-s1 taking acceleration of free fall as 10 m-s1, what is the net force acting on him? 2015-27Med A) 800 N upwards? B) Zero C) 240 N downwards D) 360 N downwards	B	As the velocity is constant hence acceleration is zero, so the net force on him is equal to zero,as the is coming with constant terminal velocity.
373.	A stone is rotated in vertical circle at the end of a string. When the stone is at the top of the circle then the tension in string is: 2011-49 Eng: (a) Greater than the weight of stone (b) Equal to the weight of the stone (c) Less than the weight of the stone (d) None of the above	C	
374.	The apparent weight of a man in a an elevator moving up with acceleration 'a' is: 2012-189 Eng: (a) mg (b) mg – ma (c) mg + ma (d) ma	C	For upward Motion= Apparent Weight = mg + ma,
375.	A body of mass 1 kg is suspended from a balance in the elevator which is accelerating downward with an acceleration of $4ms^{-2}$ reading of the balance will be. 2007-110 Med (a) 9.8 N (b) 13.8 N (c) 5.8 N (d) Zero	C	For downward Motion= $w' = mg - ma = 1 \times 9.8 - 1 \times 4 = 9.8-4 = 5.8$ N
376.	A 60 kg man in a lift which is moving upward with an acceleration of $4.9ms^2$ will have apparent weight of: 2011-53 Eng: (a) 588 N (b) 294 N	D	For upward, $W' = mg + ma= (60 \times 9.8) + (60 \times 4.9) = 882N$

(c) 58.8 N (d) 882 N

No.	Question	Answer	Explanation
377.	The pilot having a weight of 686N diving down with an acceleration of 9.8m sec^{-2} 'its apparent weight is 2008, 2011, 2010-Med: (a) 343N (b) 1372 N (c) 686 N **(d) Zero**	D	
378.	An object in a satellite orbiting around the earth is weightless because: 2012-33Med (a) g = 0 (b) It is falling freely (c) No force acts on it (d) It is far away from the earth	C	
379.	Once the space shuttle is in orbit at a radius R from earth's centre, what force does the seat exert on the astronaut? 2005-38 Med: (a)mg (b) Zero Newton (c) m/g (d) Ng/R^2	B	
380.	The paratrooper of mass 80 kg descends vertically at a constant velocity of 3.0m-s $^{-1}$ .Taking the acceleration of free fall as 10m-s $^{-1}$ find out what is the net force acting on him? (g = $10m/s^2$) 2009-36 Med: **(a) Zero** (b) 800N – Upward (c) 800N – downward (d) 240N – downward	A	
381.	You stand on a spring scale on the floor of an elevator. Of the following, the scale shows the highest reading when the elevator: 2016-141 Med **(a) Moves upward with increasing speed** (b) Moves upward with decreasing speed (c) Remains stationary (d) Moves downward with increasing speed	A	

CHAPTER-6 FLUID DYNAMICS

No.	Viscous Drag, Strokes Law & Terminal Velocity	Answer	Explanation
382.	A metal sphere of radius r is dropped into a tank of water. As it sink at speed v, it experience a drag force F given by F=krv, where k is a constant: What are the SI base units of k? 2017-Med A. kgm^2s^{-1} B. kgm^2s^{-2} C. $kgm^{-1}s^{-1}$ D. $kgms^{-2}$	C	F=krv → k=F/rv = ma/rv= $kgm^{-1}s^{-1}$
383.	Eight drops of water each radius 2mm are falling through air at a terminal velocity of 8cm/s. If they coalesce to form a single drop the terminal velocity of the combined drop will be: 2017-Med A.8 cm/s B. 16 cm/s C. 24 cm/s D. 32 cm/s	D	Vt' = $n^{2/3}$ Vt, Here n=no. of drops. Thus Vt' = $8^{2/3}$ Vt = 4 x 8 = 32cm/s
384.	Rain drops falling from sky reach the ground with: 2009-54 Med (a) Constant acceleration (b) Constant terminal velocity (c) Acceleration greater than g (d) Variable acceleration	B	Constant terminal velocity because drag force become equal to weight of the poilet after some time

No.	Question	Ans	Explanation
385.	When the drag force on the object becomes equal to its real weight then the; 2011-59 Eng: (a) Object will become stationary (b) Object will fall freely (c) Object will fall with terminal velocity (d) Object will fall with critical velocity	C	When the drag force on the object becomes equal to its real weight then the Object will fall with terminal velocity
386.	The acceleration of falling body in fluid depends upon: Med-2009 (a) Velocity (b) Viscosity of fluid (c)Density of the body (d)All of the above	D	Acceleration dpeeds on v and v depends upon density,radius and viscosisty.

Eqation of Continuity & Its Applications

No.	Question	Ans	Explanation
387.	The speed of a liquid leaving a tube depends on the change in pressure ΔP and the density ρ of the liquid. The speed is given by the equation $v = k\left(\frac{\Delta P}{P}\right)^{\Delta n}$,where k is a constant that has no units. What is the value of n? 2018-Med a)1/2 b)1 c)3/2 d)2	A	
388.	A fluid is undergoing incompressible flow which represents that: 2016- Eng (a) Pressure at a given point cannot change with time (b) Velocity at given point cannot change with time **(c) The density cannot change with time or location** (d) The velocity must be the same everywhere	C	Incompressible means that bliquid will not compress and density will remains constant
389.	Water flows through a constriction in horizontal pipe as it enters constriction, water's: med-2015 A) Speed increases and pressure remains constant B) Speed increases and pressure increase C) Speed increases and pressure decreases D) Speed decreases and pressure Increases	C	It is simply Bernoulli,s Application. Sped is iversly proportional to the pressure
390.	A larger water tank open at the top has small hole in the bottom when the water level is 30m above the bottom of the tank the speed of the water leaking from the hole is: med-2015 A) 2.5m/s B) 24 m/s C) 4 44 m/s D) Cannot be calculated unless the area of the hole is given	B	It can be solved by Torricelli Theorem; As speed is given by ;$V = \sqrt{2gh} = \sqrt{2 \times 10 \times 30}$=24.49
391.	The equation of continuity for fluid flow can be derived from the conservation of: eng-2015 A) Volume B) Mass C) Energy D) Pressure	B	From the ceonservation of mass, equation of continuity can be derived m = m →ρV= ρV → ρAx=ρAx → ρAvt = ρAvt → Av =Av
392.	Bernoulli's equation can be derived from the conservation of: med -2015 A) Energy B) Mass C) Volume D) Pressure	A	Work = K.E + P/E, it is the first ste in derivation of bernouli equation, so Bernoulli's equation can be derived from the conservation of: energy.

Bernoulli,s Equation & Its Applications

No.	Question	Ans	Explanation
393.	One end of cylindirical pipe has a radius of 1.5cm, water stream (density = 1.0×10^3 kg/m^3) steadily out at 7.0m/s, the volume rate is: Med-2015 A) 4.9×10^{-3} m^3/s B) 4.9 m^3/s C) 7.0 m^3/s D) 49 m^3/s	A	Volume rate V/t =A v=(πr^2) velocity = 3.14 x $(0.015)^2$x7= 4.9×10^{-3} m^3/s
394.	An Incompressible liquid flow along the pipe with area of cross section Aland A_1 with A_2 with velocities V_1 andV_2 respectively. The ratio of the speeds V_1 / V_2 is: med-2015	B	It is aquation of continuity; As; $A_1 V_1 = A_2 V_2$ and $V_1 / V_2 = A_2 / A_1$

A) A_1 / A_2 B) A_2 / A_1
C) $\sqrt{\frac{A_1}{A_2}}$ D) $\sqrt{\frac{A_2}{A_1}}$

395.	A two meter high tank is full of water. A hole is made in the middle of the tank. The speed of efflux is; 2011- Med (a) 4.9 ms^1 (b) 9.8 ms^{-1} (c) 4.42ms^{-1} (d) 3.75 ms	C	At middle of the tank, height of water is 1m so Efflux velocity = V = $\sqrt{2gh}$ = $\sqrt{2 \times 9.8\, x\, 1}$ = $\sqrt{19.36}$ = 4.4 m/s
396.	Water flows from a 6.0cm diameter pipe into 8.0cm diameter pipe. The speed in the 6.0cm pipe is 5.0m/s. the speed in the 8cm pipe is: 2016- Med **(a) 2.8m/s** (b) 3.7m/s (c) 6.6m/s (d) 8.8m/s	A	D_1=6 cm and D_2=8 cm or R1= 3 cm and R2= 4 cm and v1= 5m/s so by A1V1=A2V2 or $r_1^2 v_1$= $r_2^2 v_2 \rightarrow 3^2$ x 5 = 4^2 x $v_2 \rightarrow v_2$ = 45/16 =**2.8m/s**
397.	One end of a cylindrical pipe has a radius of 1.5cm. Water (density = 1.0 × 10^3 kg/m^3j which mass is leaving the pipe is: 2016-172 Eng (a) 2.5kg/s **(b) 4.9kg/s** (c) 48 kg/s (d) 7.0 × 10^3 kg/s	B	

CHAPTER-7:- OSCILLATIONS

Oscilation and simple harmonic motion

398.	The kinetic energy and potential energy of a particle executing simple harmonic motion will be equal for the displacement (where x_o is the amplitude); 2017-med A. x $\sqrt{\frac{2}{3}}$ B. x/2 C.x/$\sqrt{2}$ D. x$\sqrt{2}$	C	K.E = P.E $\rightarrow \frac{1}{2}\, k\, (r^2 - x^2) = \frac{1}{2} kx^2$ $\rightarrow (r^2 - x^2) = x^2$ $\rightarrow r^2 = x^2 + x^2$ $\rightarrow r^2 = 2x^2$ $\rightarrow x^2 = r^2/2$ $\rightarrow x = \sqrt{r^2/2}$ $\rightarrow x = r/\sqrt{2}$ x= a/$\sqrt{2}$ where x is displacemt and a is amplitude
399.	If x-component of a vector is v3 and y-component is 1, then the angle made by the vector along x-axis is: 2017-med A. 60° B. 30° C. 45° D. 90°	A	Tanθ =x-component/y-component.the tanθ =$\sqrt{3}$/1. Θ = $\tan^{-1}\sqrt{3}$ = 60^0
400.	Two springs of spring constants k1 and k2 are stretched by the same force. They are stretched by x1 and x2 respectively, If k1 >k2 then: 2017-eng a)x1=x2 B)x1>x2 C)x1<x2 D) Depends on the length of the spring	C	
401.	A spring is stretched by 5 cm. Its potential energy is E. If it is stretched by 10 cm, its potential energy will be 2017-eng A) 2 B) 4E C) 8E D)16E	B	

No.	Question	Ans	Explanation
402.	A particle executes SHM along a straight line. Its amplitude is A The potential energy of the particle is equal to the kinetic energy when the displacement of the particle from the mean POSITION IS ; 2017-med A.Zero B. ±A/2 c). ±A/$\sqrt{2}$ D.2A	C	K.E = P.E $\rightarrow \frac{1}{2}k(r^2 - x^2) = \frac{1}{2}kx^2$ $\rightarrow (r^2 - x^2) = x^2$ $\rightarrow r^2 = x^2 + x^2$ $\rightarrow r^2 = 2x^2$ $\rightarrow x^2 = r^2/2$ $\rightarrow x = \sqrt{r^2/2}$ $\rightarrow x = r/\sqrt{2}$ x= a/$\sqrt{2}$ where x is displacemt and a is amplitude
403.	In S.H.M, the fraction of kinetic energy to total energy when displacement is one-half of the Amplitude is 2017-med A.1/8 B.1/2 C.1/4 D.3/4	D	K.E=$1/2k(x^2 - (x/2)^2)$ = K.E= `$1/2k(x^2 - x^2/4$ =$1/2\ k(3x^2/4) = 3kx^2/8$ = $3/4\ (kx^2/2)$ =3/4 T.E
404.	The time period of the simple pendulum is 2 second. If its length is increased by 4 times, then its period becomes; 2017-med A. 16s B. 12s C.8s D. 4s	D	$T = 2\pi\sqrt{\frac{l}{g}}$ $T' = 2\pi\sqrt{\frac{4l}{g}}$ $= 2[2\pi\sqrt{\frac{l}{g}}] = 2\ T = 2 \times 2 = 4$ sec
405.	Two springs of spring constant k2 and K2 are arranged in parallel and a body of mass m is attached to it then calculate the time period of the system: 2018-med A) $2\pi\sqrt{\frac{m}{k1+k2}}$ B) $2\pi\sqrt{\frac{2m}{k1+k2}}$ C) $2\pi\sqrt{\frac{mk1k2}{k1+k2}}$ D) $2\pi\sqrt{\frac{k1+k2}{m}}$	a	Spring arranged in parallel, K_{eq} = k1+k2+k3…..
406.	In SHM the acceleration of the particle is zero when its: 2018-med A) Velocity is zero B) Displacement is zero C) Both velocity and displacement are zero D)Both velocity and displacement are maximum Hints: As a α-x if x=0 than a=0	B	
407.	A mass m is suspended from a spring of spring constant k. The angular frequency of oscillations of the spring is: 2018-med A) k/m B) $\sqrt{\frac{k}{m}}$ C) m/k D) $\sqrt{\frac{m}{k}}$	B	
408.	Which one of the following varies when an object execute simple harmonic motion? 2018-eng A)Angular frequency B)Total energy C)Force D)Amplitude	C	
409.	If a hole is bored through the center of the earth and a pebble is dropped in it, then it will: 2018-eng A)Stop at the center of the earth B) Drop to the other side C)Execute SHM D) Fall with a constant velocity.	C	
410.	A body in simple harmonic motion makes n complete oscillation in one second. The angular frequency of this	C	f=$\frac{Number\ of\ cycle}{Seconds} = \frac{2\pi n rad}{s}$ =2π rad-s^{-1}

motion is: 2015- Eng

A) π rad-s^{-1} B) $1/\pi$ rad-s^{-1}

C) 2π rad-s^{-1} D) $\frac{n}{2\pi} rad - s^{-1}$

Circular motion and simple harmonic motion

No.	Question	Ans	Explanation
411.	A particle performs simple harmonic motion of amplitude 0.02m and freq 2.5 Hz, what is its maximum speed? Eng-2009-2015 A) 0.0008 ms^{-1} B) 0.125 ms^{-1} C) 0.157 ms^{-1} D) 0.314 ms^{-1}	D	Velocity is given by: v =$\omega\sqrt{r^2 - x^2}$, the speed is maximum when x = 2 so v becomes v = $\omega\sqrt{r^2}$ = ωr = (2πf)r =2 x 3.14x2.5 x 0.02 = 0.314 ms^{-1} **NOTE:** for maimum velocity x=0 and for zerovelocity r = x
412.	If the displacement of a particle executing S.H.M is given by x = $\frac{5}{n}$ sin (20πf t) cms, its amplitude is: Eng-2015 A) $\frac{5}{n}$m B) $\frac{5}{n}$ cm C) 20πcms D) 100 cms	B	Given; x = $\frac{5}{n}$ sin (20πf t) and we know that; x = x_0 sin (ωt) = x_0 sin (2πft) Comparing both equations we get; $x_0 = \frac{5}{n} cm$ where x_0 = amplitude

Simple pendulum and Hook's law

No.	Question	Ans	Explanation
413.	The total energy of the body executing S.H.M is E. The K.E when the displacement is half of the amplitude is: Eng-2015 A) $\frac{E}{a}$ B) $\frac{E}{4}$ C) $\frac{3E}{4}$ D) $\sqrt{\frac{3}{4}E}$	B	K.E = $\frac{1}{2}$k ($x_o^2 - x^2$) When x = x_o/2 so = $\frac{1}{2}$k (x_o^2 - ($\frac{x_0}{2}$)^2) = $\frac{1}{2}$k (x_o^2 - $\frac{x_o^2}{4}$) = $\frac{1}{2}$k x_o^2 (1- $\frac{1}{4}$) = $\frac{1}{2}$k x_o^2 (3/4) We know that $\frac{1}{2}$k x_o^2 =E So K.E= E $\frac{3}{4}$ = $\frac{3E}{4}$
414.	At what place, the motion of the bob of simple pendulum will be the slowest? Med-2010 (a) At poles of earth (b) At equator of earth (c) Anywhere on the surface of earth (d) None of these	B	As earth I oval shape so at equator radius is more, g is low, time period will high ans motion will be slowest. → r α1/g → T α1/motion
415.	A simple pendulum is suspended on the roof of a lift when the lift is moving downward with an acceleration a (a<g), then its time period is given by T= $2\pi\sqrt{\frac{l}{g}}$ where g is equal to ; Eng-2015 A) g B) g-a C) (g+a D) g^2	B	When lift is moveing downward, the g decrease by an amount of a, so new g becomes G' = g-a
416.	If a tunnel is bored through the centre of the earth and a stone is dropped into it then the: Med-2010 (a) Stone will stop at the centre of the earth (b) Stone will move out fro other side of the tunnel (c) Stone will perform simple harmonic motion (d) None of these	C	The stone is attracted by centre of earth and it will reach to ccentre, but due to inertie it doesnot stop at centre but continues its motion but again it is attracted by centre of easth and so on the stone make simple harmonic motion at the centre.
417.	The period of simple pendulum double when: Med-2009 (a) Its length is double (b) The mass of the bob is double (c) Its length is made four time (d) The mass and length of the pendulum is made two times	C	We know that T= $2\pi\sqrt{\frac{l}{g}}$ when lenth is made four times T= $2\pi\sqrt{\frac{4l}{g}}$ = T= $2\pi(2)\sqrt{\frac{l}{g}}$ = (T= $2\pi\sqrt{\frac{l}{g}}$) = 2T

No.	Question	Ans	Explanation
418.	If the length of a simple pendulum is halved and mass is doubled then its time period. Eng-2012 (a) Increases by $\sqrt{2}$ (b) Remains constant (c) Cannot be predicted (d) Decreases by $\sqrt{2}$	A	We know that T= $2\pi\sqrt{\frac{l}{g}}$, so when L=L/2 and m = 2m then T= $2\pi\sqrt{\frac{2l}{g}} = \sqrt{2}(2\pi\sqrt{\frac{l}{g}}) = \sqrt{2}T$
419.	While determining the expression for time period of simple pendulum, we keep the amplitude, Med-2005 (a) Large (b) Small (c) Maximum (d) Zero	B	The amplitude is kept small because for small θ, sin θ= θ
420.	How much will be the length of a simple pendulum if its time period is one second Med-2010 (a) 2.5 m (b) 0.25 m (c) 25 m (d) 0.025 m	B	We know that T= $2\pi\sqrt{\frac{l}{g}}$, L= $\frac{T^2g}{4\pi^2}$ Putteing t=1 and g=9.8 and T=1 so L= $\frac{T^2g}{4\pi^2} = \frac{1^2 9.8}{4\times(3.14)^2} = \frac{9.8}{4\times9.8} = \frac{1}{4}$ = 0.25 m
421.	The displacement 'x' of a particle at time 't' is given by x = 10 sin 4t. the particle oscillates with period. Med-2014 (a) π/10s (b) π/5s (c) π/4s (d) π/2s	D	We know that: x = x_0 sin (ωt) x_0 sin (2πft), given: x = 10 sin 4t. comparing both of these, we get 2πf = 4 → f= 4/2π= 2/π & T=1/f= π/2
422.	If a hole is bored through the center of the earth and a pebble is dropped in it. Then it will: Med-2014 (a) Execute SHM (b) Drop to the other side (c)Stop at the center of the earth (d) None of the above	A	The stone is attracted by centre of earth and it will reach to ccentre, but due to inertie it doesnot stop at centre but continues its motion but again it is attracted by centre of easth and so on the stone make simple harmonic motion at the centre.
423.	The period of a simple pendulum can be increased by: Eng-2014 (a) Decreasing the length of the pendulum. (b) Increasing the length of the pendulum. (c) Increasing the mass of the bob. (d) Decreasing the mass of the bob.	B	T= $2\pi\sqrt{\frac{l}{g}}$, time period is directly proportional to underroot of l , so increasing length will increase the temperatures; NOTE: time period is independent to mas
424.	The total energy of a particle executing S.H.M. is: Med- 2016 (a) Inversely proportional to square of amplitude (b) Directly proportional to the amplitude (c) Zero (d) Directly proportional to the square of amplitude	D	We know that E= $\frac{1}{2}k\, x_o^2$ where x_o is amplitude.so energy is directly proportional to the square of amplitude.
425.	The time period of a simple pendulum is 2 seconds. If its length is increased by 4 times, then its period becomes: Med-2016 (a) 16 s (b) 12 s (c) 8 s **(d) 4 s**	D	We know that T= $2\pi\sqrt{\frac{l}{g}}$, if L=4L then T'= $2\pi\sqrt{\frac{4l}{g}} = (2)2\pi\sqrt{\frac{l}{g}} = (2)\,T$ Putting T=2 then T'= 2 x 2 = 4s
426.	The kinetic energy and potential energy of a particle executing simple harmonic motion will be equal when displacement is: (Where 'a' is the amplitude) Eng-2016 (a) $a\sqrt{\frac{2}{3}}$ (b) $\frac{a}{2}$ **(c)** $\frac{a}{\sqrt{2}}$ (d) a √2	C	P.E= $\frac{1}{2}k\,x^2$, K.E = $\frac{1}{2}k\,(x_o^2-x^2)$, according to conditions P.E=K.E → $\frac{1}{2}k\,x^2 = \frac{1}{2}k\,(x_o^2-x^2$ → $x^2 = x_o^2-x^2$ → $x^2 + x^2 = x_o^2$ → $2x^2 = x_o^2$ → $x^2 = x_o^2/2$ taking underroot $x = \frac{x_o}{\sqrt{2}} = \frac{a}{\sqrt{2}}$

Mass spring system

No.	Question	Ans	Explanation
427.	A spring obeying Hook's law has an un stretched length of 50 mm and a spring constant of 400 Nm^{-1}. What is the tension in the spring when its overall length is 70mm? Med-2013 (a) 8.0 N (b) 28 N (c) 160 N (d) 400 N	A	By Hook's law F = KΔx, Here Δx = 70mm-50 mm = 20 mm = 0.02 cm and K = 400 Nm^{-1}. So F = 400 × 0.02 = 8N. **NOTE;** tension is simply a force.
428.	A spring system executes simple harmonic motion. If a load is added to it then the time period of spring–mass system will be, Med -2012 (a) Increased (b) Decreased (c) The same (d) Halved	A	Formass spring sytem T= $2\pi\sqrt{\frac{m}{k}}$, fre\om equation time period is directly proportional to$\sqrt{m}$ so increase in mass will increase the time period. **NOTE:** time period of simple pendulum is independent to mass whilt that of mass spring system directly proportional to $\sqrt{m}$.
429.	A weight suspended from an ideal spring oscillates up and down with a period T. If the amplitude of the oscillation is doubled, the period will be: Med-2016 **(a) T** (b) 1 (c) 2T (d) T	A	We know that; T= $2\pi\sqrt{\frac{m}{k}}$,the time period of SHM is independent of amplitude of oscillation.

Phase

No.	Question	Ans	Explanation
430.	The quantity which specified the displacement as well as the direction of motion in simple harmonic motion is the, Med-2011 (a) Phase angle (b) Angular frequency (c) Path difference (d) None of these	A	The angle θ = ωt wich specifies the displacement x and as wellas the direction of motion of the point oscillating SHM is called phase.

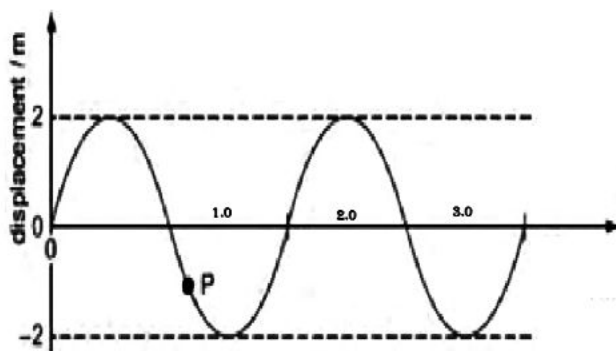
Resonance

No.	Question	Ans	Explanation
431.	The heating and cooking of food evenly by mocro wave oven is an example of: Eng-2010 (a) Resonance (b) Specific heat (c) Damped oscillation (d)None of these	C	Radio, microwave oven and MRI are example of resonance
432.	MRI works on the principle of: Med-2012 (a) Beats (b) Interference (c)Resonance (d)Standing waves	A	Radio, microwave oven and MRI are example of resonance
433.	It is impossible for two particles, each executing simple harmonic motion, to remain in phase with each other if they have different: Eng-2016 (a) Masses (b) Periods (c) Amplitudes (d) Spring constants	C	To remain in phase for two particle, they must have same amplitude.

CHAPTER-8:- WAVES

Waves,its types & Characteristics:

No.	Question	Ans	Explanation
434.	It is impossible for two particles, each executing simple harmonic motion, to remain in phase with each other if they have different: 2017-Med (a) Masses (b) Periods (c) Amplitudes (d) Spring constants	B	

No.	Question	Ans	Explanation
435.	A wave of amplitude 20 mm has intensity I. another wave of the same frequency but of amplitude 5 mm has intensity Iy. What is Ix/ly? 2017-Med A) 2 B) 4 C) 16 D) 256	c	As we know that; I(Intensity)= Energy/Area.time So, IαE and $E=1/2kx_0^2$ Thus $E\alpha x^2$ So $Ix/ly=x^2/y^2$ .Thus $Ix/ly= (20)^2/(5)^2=$ 400/25=16
436.	In a stationary wave the distance between consecutive antinodes is 25cm. If the wave velocity is 300m/s, then the frequency of the wave will be: 2017-Med A) 150 Hz B) 300 Hz C) 600 Hz D) 750 Hz	C	In Stationary wave the distance b/w consecutive antidote is $L = \lambda/2$ so $\lambda =2L$ = 2(25)=50cm But 100cm=1m and 50cm= 50/100=0.5m Now $v=f\lambda$ and $f=v/\lambda=300/0.5=600$Hz
437.	A Turning fork A produces 4 beats / second with another turning fork B of frequency 280 Hz. When fork A is loaded with a little wax, the beat frequency change to 2. The frequency of fork A before loading is: 2017-Med A. 292 Hz B.284 Hz C. 290 Hz D. 288 Hz	B	
438.	A man standing next to a stationary train hears sound of frequency 400 Hz emitted from the train's horn.The train then moves directly away from the man and sounds its horn when it has a speed of 50m/s. The speed of sound is 340m/s.What is the difference in frequency of the sound heard by the man on the two occasions? 2017-Eng A.51 Hz B.69 Hz C 349 Hz D.469 Hz	A	
439.	19. A sound has a speed of 330 m/s and a frequency of 50 Hz. What is a possible distance between two points on the wave, that have a phase difference of 60^0? 2017-Eng A)0.03 m B)I.I m C) 2m D)6.6 m	B	
440.	Standing waves are produced in 10 m long stretched string. If the string vibrates in 5 segments and wave velocity is 20 ms, its frequency is: 2017-Med A. 2 Hz B. 4 Hz C.5 Hz D. 10 Hz	C	$\lambda_n = 2L/n = 2 \times 10/5 = 4$m As $f=v/\lambda = 20/4=5$ Hz
441.	A stationary sound wave has a series of nodes. The distance between the first and the sixth node is 30.0 cm. What is the wavelength of the sound wave? 2018-Med D)12.0 cm A)5.0 cm B)6.0 cm d)10.0 cm	D	
442.	A transverse wave travels along a rope The graph shows the variation of the displacement of the particles in the rope with distance along it at a particular instant 2018-Med	A	

At which distance along the rope do the particles have maximum upwards velocity?

A)0.5 m B) 1.0 m

C)1.5 m D)20 m

No.	Question	Ans	Explanation
443.	Which one of the following is not a characteristic of stationary waves? 2018-Med A)Half wavelength is, half the distance between the adjacent nodes B)Amplitude is not the same C)Phase is identical between two adjacent nodes D)Energy of stationary waves travels outwards	D	
444.	The energy of electromagnetic radiation depends on its: 2015-Eng A) Frequency B) Wave length C) Wave number D) All of the above	D	E = hf and f =c/λ and so energy depends upon wavelength , frequency and wave number.
445.	The wave velocity in any medium depends upon, 2010-Med (a)Elasticity (b) Density (c) Homogeneity (d) All of the above	D	As v = $\sqrt{\frac{E}{\rho}}$, velocity depends upon density , elasticity and also on homogeneity.
446.	Of the following properties of a wave, the one that is independent of the others is its:2013-183 Med: (a) Amplitude (b) Wavelength (c) Speed (d) Frequency	A	v= f λ ……v,f & wavelength depend each other..The amplitude is the independent parameter.
447.	Which one of the following properties of light does not change with the nature of medium? 2011-Eng: (a) Frequency of light (b) Wavelength of light (c) Speed of light (d) All of these	A	Frequency of light is independent to medium it passes and does not change with the medium through which it passes.
448.	When sound waves move from one medium to other medium the quantity which remains unchanged is: 2010-Med (a) Wavelength (b) Frequency (c) Speed (d) Intensity	B	Frequency of light is independent to medium it passes and does not change with the medium through which it passes.
449.	Which one of the following properties of electromagnetic waves do not change in vacuum? 2012-Med: (a) Speed (b)Wavelength (c)Frequency (d)All of the above	D	All of these
450.	If the speed of the moving particle increases the wavelength associated with it will. Med-2016 (a) Increase (b) Decrease (c) Not change (d) None of these	A	V=fλ ao if v increase the wavelength will also increases
451.	The frequency of light having wavelength 3 x 10^{-3} cm is 2011-Med (a) 1×10^{6} (b) 3.0×10^{7}	D	v=3 x 10^{-3} cm or 3 x 10^{-5} c m so by v=fλ→f=v/λ= $\frac{3\times10^{8}}{3\times10^{-5}}$ = 1×10^{13}

	Question	Ans	Explanation
	(c) 1×10^{10} (d) 1×10^{13}		
452.	The wavelength of sound made from a tuning fork of frequency 330 Hz is nearly: 2009- Med (a) 330 m (b) 100 m (c) 10m **(d) 1m**	D	V = fλ soλ=v/f = $\frac{332}{330}$=1m
453.	The wavelength of a wave traveling with speed v and having frequency *f* is: 2012-Eng, 2008- Med **(a)** $\lambda = \frac{v}{f}$ (b) $\lambda = vf$ (c) $\lambda = \frac{f}{v}$ (d) None of the above	A	V = fλ so λ=v/f
454.	What is the relationship between the intensity and the amplitude of a wave? 2012-Eng: (a) $\frac{I}{a}$=constant (b) Iu^2 = constant (c) $\frac{I}{a^2}$ = constant (d) I a =constant	C	Intensity is directly proportional to the square to the amplitude Iα A^2 or I/A^2 constant.
455.	The intensity of a wave is: 2012-Med (a) Directly proportional to amplitude (b) Directly proportional to (amplitude)2 (c)Inversely proportional to amplitude (d)Inversely proportional to $(\text{amplitude})^2$	B	Intensity is directly proportional to the square to the amplitude Iα A^2 or I/A^2 constant.
456.	What is the relationship between the intensity 'I' and the amplitude 'a' of a wave? 2014- Med: (a) I a = constant (b) l a^2 = constant **(c)** l/a = constant (d) l/a^2= constant.	D	Intensity is directly proportional to the square to the amplitude Iα A^2 or I/A^2 constant.
457.	In vacuum all electromagnetic waves have the same: 2014-Med: (a) Speed (b) Energy (c) Frequency (d) wavelength	A	All electromagnetic waves have same speed in in vacuum.
458.	The waves which do not require any medium for their propagation are called: 2014-Med: (a) Mechanical waves (b) Sound waves (c) Tidal waves (d) Electromagnetic waves	d	Electromagnetic wave does not require medium for the propagation while mechanical waves need so.
459.	The frequency of green light is 6×10^{14} Hz. Its wave length is: 2015-Med A) 50 nm B) 500 nm C) 5000 nm D) 100 nm	B	v =fλ →λ=v/f= $\frac{3\times10^8}{6\times10^{14}}$ = $0.5\times10^{-6} = 500\times10^{-3}\times10^{-6} = = 500\times10^{-9}$ **=500 nm**
460.	If the amplitude of wave at a distance r from a point source is A then amplitude at a distance 2r will be : 2015-eng A) 2A B)A C)A/2 D) A/4	A	Amplitude is directly proportional to distance.
461.	A science museum designs an experiment to show the fall of a feather in a vertical glass vacuum tube. The time of fall from test is too close to 0.5 s. What length of tube is required? 2015-Med A) 1.3 m B) 2.5 m C) 5.0 m D) 10.0 m	A	S= vit+1/2 at^2 as vi=0 so s=1/2 gt^2 → s = $\frac{1}{2}$ gt^2= $\frac{1}{2}$10 x$(0.5)^2$=1.25 =**1.3 m**

Speed of Sound,Superposition of waves

No.	Question	Ans	Explanation
462.	The ratio between the velocity of sound in air at 4 atm and that at 3. atm pressure would be: 2015-Med A) 1 : 1 B) 4 : 1 C) 1 : 4 D) 3 : 1	A	Speed of Sound is independent of pressure. So ratio will same
463.	What will be the effect on the speed of transverse waves on a string if the tension in the string remain constant but the diameter of the string becomes double? (a) Remains constant (b) Becomes Half (c) becomes double (d) Becomes four times	B	
464.	When the light enters from air to glass, it suffers a change in the, 2011- Med (a) wavelength of light (b) speed of light (c) frequency of light (d) wavelength and speed of light	d	When the light enters from air to glass, it suffers a change in the wavlngth and speed byt frequency remains constant.
465.	Speed of sound is independent of, 2007-Med (a) Density of medium (b)" T" of medium (c) "P" of medium (d) Elasticity of medium	C	$V = \sqrt{E/\rho}$,Speed of sound depends on elasticity & density and independent to pressure.
466.	Through which medium the sound waves travel faster? 2010-Eng: (a) O_2 (b) CO_2 (c) H_2 (d) N_2	C	$V = \sqrt{E/\rho}$,Speed of sound depends on elasticity & density as hydrogen have less mass & less density so in it will have high speed of medium.
467.	If the speed of sound in air is 340 m/sec. what is the wavelength of a 1-KHz sound wave med-2013 (a) 3.40m (b) 2.94m **(c) 0.340m** (d) 0.294m	C	we khow that $v=f\lambda$, here f = 1kHz =1000 Hz so by formula λ=v/f = 340/1000=0.340
468.	When the pressure in a medium increases, the speed of sound in that medium: eng-2013 (a) Increases (b) Decreases (c) Does not change (d) Sometimes increases & sometime decreases	C	Speed of Sound is independent of pressure.
469.	What is the optimum difference in phase for maximum destructive interference between two waves of the same frequency?2013- Eng (a) 180^o (b) 90^o (c) 270^o (d) 360^o	A	What is the optimum difference in phase for maximum destructive interference between two waves of the same frequency is 180^o and for constructive is 0^o .

Beats, phase change & Stationary wave

No.	Question	Ans	Explanation
470.	In a vibrating cord the point where the particles are stationary is called: 2014-82 Med: (a) Crest (b) Anti-node (c) Node (d) Trough	C	**A node is a point along the stading wave where the wave has minimum amplitude and points are stationary.**
471.	The phase change of 180^o is equal to path difference: 2011-83 Eng: (a) Zero (b) Half the wavelength (c) Double of wavelength (d) Quarter the wavelength	B	$\lambda = 360^0$ & $180^0 = \frac{\lambda}{2}$,
472.	Two waves of the same frequency and amplitude, traveling in opposite direction along the same path will form, 2008-15 Med: (a) Electromagnetic waves (b) Micro waves (c) Standing waves (d) Sound waves	C	Standing waves are formed when Two waves of the same frequency and amplitude, traveling in opposite direction interferes.
473.	The number of loops in stationary waves depends upon: 2011-75 Med: (a) Velocity of waves (b) Wavelength of waves (c) Nature of the medium (d) Frequency of waves	D	Number of loops in stationary waves depend upon the frequency

474. Sound waves, emitted by small loudspeaker are reflected by wall. The frequency of the waves is adjusted until a stationary wave is formed with the antinodes nearest the wall at a distance x from the wall. Which expression goes in terms of x and the speed of sound is: 2012-200 Eng:

(a) $f=\frac{c}{2x}$ (b) $f=\frac{2c}{x}$

(c) $f=\frac{c}{x}$ (d) $f=\frac{2x}{c}$

Answer: B

---

475. The frequency of the fundamental mode of a string stretched by a tension T and having mass m and length l is given by: 2008-40 Med:

(a) $f=\frac{1}{2}\sqrt{\frac{T}{ml}}$ (b) $f=\frac{1}{2l}\sqrt{\frac{lT}{m}}$

(c) $f=\frac{1}{2l}\sqrt{\frac{T}{m}}$ (d) $f=\frac{l}{2}\sqrt{\frac{T}{m}}$

Answer: B

---

476. In stationary wave, the distance between a consecutive node and an antinode is equal to; 2012-69 Eng:

(a) $\frac{\lambda}{2}$ (b) $\frac{3\lambda}{4}$

(c) λ (d) $\frac{\lambda}{4}$

Answer: D

---

477. When the light is moving from rare medium to denser medium on reflection it suffers a phase change of; 2011, 2005, 2006-Med: 2012- Eng:

(a) 180^o (b) 120^o

(c) 90^o (d) 0^o

Answer: A

---

478. A 3m long string resonates in 3 loops. The frequency of stationary wave having velocity of 30 m/s mainly;

(a) 5 H_z (b) 30 H_z

(c) 15 H_z (d) 10 H_z

Answer: C

$f_3=\frac{3v}{2l}=\frac{3\times30}{2(3)}=15H_z$

---

479. In stationary waves: 2016-34 Med

(a) There is not transfer of energy (b) Energy is constant at all points

(c) Phase is the same for all points (d) both (a) & (b)

Answer: A

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480. The number of loops in the standing waves is directly dependent on: 2016-56 Med

(a) Wavelength **(b) Frequency**

(c) Velocity (d) Speed

Answer: B

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481. Two tuning forks of frequencies 256Hz and 260Hz are sounded together the time interval between two consecutive maximum sound heard by a listener is: 2016-165 Med

(a) 0.5 Sec (b) 2 Sec

(c) 1 Sec **(d) 0.25 Sec**

Answer: D

260 – 254 =4 hz
T=1/f=1/4=0.25 sec

---

482. In a stationary wave the distance between consecutive antinodes is 25 cm. If the wave velocity is $300ms^{-1}$ then the frequency of the wave will be: 2016-23 Eng

(a) 150 Hz (b) 300 Hz

(c) 600 Hz (d) 750 Hz

Answer: C

Distance b/w consecutive antinodes=λ/2= 25 cm Thus λ=25x2=50cm=0.5m
As; v=fλ &
f=v/λ=300/0.5=**600 Hz**

---

483. It is impossible for two particles, each executing simple harmonic motion, to remain in phase with each other if they have different: 2016-181Eng

(a) Masses (b) Periods

Answer: C

(c) Amplitudes (d) Spring constants

Organ pipes,Doppler Effect & Ultrasonic waves:

484.	The sound waves of frequency more than 20 kHz are termed as: 2017-Med A. Supersonic B. Audible C. Infrasonic D. Ultrasonic	D	
485.	When a car travelling with constant velocity passes a stationary observer, the observer hears a change in frequency of sound emitted by car. Which statement is correct? 2017-Med A. The change in frequency is greater as a car moves away than as it approaches. B. The greater the speed of the car, the greater the change in observed frequency. C. The observed frequency is lower as the car moves toward the observer and higher as the car moves away from the observer D. The volume of the sound heard by the observer does not change as the car approaches.	B	
486.	An organ pipe of length T has one end closed but the other end open. What is the wavelength of the fundamental node emitted? 2013-146 Med (a) Slightly smaller than 4l. (b) Slightly larger than 4l. (c) Roughly equal to 3l/2. (d) Slightly larger than 2l.	B	
487.	An organ pipe is open at both ends at its fundamental frequency. Neglecting any end effects, what wavelength is formed by this pipe in this mode of vibration, if the pipe is two meter long? (a) 2m (b) 4m (c) 6m (d) 8m	B	$\lambda = 2(l) = 2(2) = 4m$
488.	In open organ pipe of length is the wavelength of fundamental note is: 2009-91 Med: (a)Equal to l (b) Equal to 2l (c) Equal to 4l (d)Equal to $\frac{3l}{2}$	B	
489.	Doppler's effect is applicable to: 2010-28 Eng: (a) Sound waves (b) Light waves (c) Light waves (d) Both sound and light waves	D	
490.	A 30-cm long string, with one end clamped and the other free to move transversely, is vibrating in its second harmonic. The wavelength of the constituent traveling waves is: 2016-171 Med (a) 10 cm **(b) 30 cm** (c) 40 cm (d) 120 cm	B	

CHAPTER-9: PHYSICAL OPTICS

Coherent Sources ,Interference & Young,s Double Split Experiment:

491. Coloured fringes observed in soap bubbles are the example of: 2017-Eng — **B**

A.Diffraction B.Interference
C.Reflection D.Refraction

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492. Monochromatic green light of wave length 5 x 10^{-7} m illuminates a pair of silts 1mm apart the separation of bright lines on the interference pattern formed on a screen 2m away is: 2017-Eng — **C**

A. 0.25m B. 0.1mm
C. 1.0mm D. 0.0lm

Y= λd/d

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493. Two wave sources are oscillating in phase.Each source produces a wave of wavelength λ. The two waves from the sources meet at point X with a phase difference of 90°. What is a possible difference in the distances from two wave sources to point X? 2018-Med — **B**

A) λ/8 B) λ/4
C) λ/2 D) λ

$\frac{phase\ difference}{path\ difference} = 2\pi/\lambda \rightarrow$ path difference = phase difference x λ /2π
Here Phase difference =90^0 and π = 180^0
path difference = phase difference x λ /2π = 90 x λ/2 x 180^0 = λ/4

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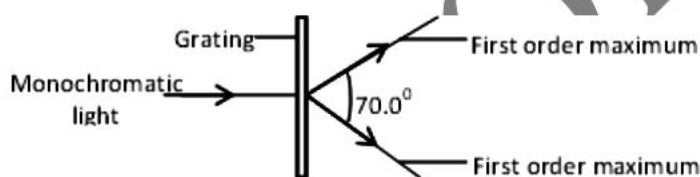
494. A diffraction grating is used to measure the wavelength of monochromatic light, as shown in the diagram — **C**

The spacing of the slits in the grating is 1.00 x 10^{-6} m. The angle between the first order diffraction maxima is 60.0° What is the wavelength of the light? 2018-Med

A)287 nm B)470 nm
C)574 nm D)940 nm.

---

495. In Young double slit experiment with sodium light, the slit are 0.589 m apart. What is the angular Width of the third maximum given λ=589nm: 2017-MEd 2017107 Med — **A**

A.$\sin^{-1}$ (3x10^{-6}) B. $\sin^{-1}$ (3x10^{-8})
C. $\sin^{-1}$ (3x10^{-6}) D. $\sin^{-1}$ (3x10^{-8})

: dsinθ=mλ
Θ= $\sin^{-1}$ mλ/d=$\sin^{-1}$ 3 x 589 x 10^{-9} /0.589 = $\sin^{-1}$ (3x10^{-6})

---

496. When the light form two lamps falls on a screen, no interference pattern can be obtained. Why is this? 2018-Eng — **c**

A)The lamps are not point sources
B)The lamps emit light of different amplitudes.
C)The light from the lamps is not coherent
D)The light form the lamps is white.

---

497. Two coherent monochromatic sets of waves will interfere constructively in the region of superposition only if the path difference between them is: 2008-132 Med — **B**

(a)Half wavelength

(b)Integral number of wavelength
(c) Quarter wavelength
(d)Odd integral number of half wavelength

No.	Question	Ans	Explanation
498.	When the light from two lamps falls on a screen, no interference pattern can be obtained. Why is this? 2013-196Med (a) The lamps are not point sources (b) The lamps emit light of different amplitudes (c) The light from the lamps is not coherent (d) The light from the lamps is white.	C	
499.	If the width of the slit on the young's double slit experiment becomes double the fringe spacing will become: 2011-86 Eng: (a) Double (b) One quarter (c) Four times (d) Half	D	$\Delta y = m\lambda\frac{D}{d}$,
500.	If a green light in a Young double slit experiment is replaced by monochromatic orange light of the same intensity. Then: 2009-67 Med (a) Fringe width will decrease (b) Fringe width will increase (c) Fringe width will remain the same (d) Fringe width will become less intense	B	As λ increases fringe width increase i.e $\Delta y \propto \lambda$
501.	The colour in the soap bubble are due to; 2012-29 Med (a) Interference (b) dispersion of light (c) Scattering of light (d) Refraction of light	A	
502.	Which of the following color have greater wavelength? 2015-173 Eng A) Red B) Blue C) Green D) Orange	A	
503.	The colour of sky is blue due to: (a) Interference of light (b) Diffraction of light (c) Polarization of light (d) Scattering of light	D	
504.	The colour of thin films is a result of: 2016-96 Med (a) Dispersion (b) Absorption of light (c) Scattering of light **(d) None of the above**	D	
505.	The fringe width in Young's double slit experiment increases when? 2016-42Eng **(a) Wavelength increases** (b) Distance between the source and slit decreases (c) Distance between the slits increases (d) The width of the slits increases	A	$\Delta y = m\lambda\frac{D}{d}$, As λ increases, fringe width increase i.e $\Delta y \propto \lambda$
506.	In Young's double slit experiment both the separation between the slits and the distance between the slits and the screen are halved; then the fringe width is: 2016-189 Med (a) Halved **(b) Unchanged** (c) Doubled (d) Zeros	B	$\Delta y = m\lambda\frac{D}{d}$
507.	The fringe width in Young's double slot experiment increases when? 2016-42 Eng **(a) Wavelength increases** (b) Distance between the source and slit decreases (c) Distance between the slits increases (d) The width of the slits increases	A	
508.	In the equation dsin $\theta = m\lambda$ for the lines of a diffraction grating m is: 2016-121 Eng (a) The number of slits (b) the slit width (c) The slit separation **(d) The order of the line**	d	

Michelson,s Interferometer & Diffraction:

509. The device which can be used for the precise measurement of wavelength is: 2010-110 Med: — D
(a) Grating plate (b) Polaroid
(c) Prism (d) Michelson interferometer

510. When a wave comes across an obstacle, it bands ground the obstacle. This phenomenon of bending
around of a wave is called: 2012-94 Eng:, 2005-58 Med: — D
(a) Polarization (b) Interference (c) Reflection (d) Diffraction

511. We can hear sound around the corner but cannot see because of: 2011-85 Med: — B
(a) Interference (b) Diffraction
(c) Polarization (d) Dispersion

512. Two monochromatic radiations X and Y are incident normally on a diffraction grating. The second order intensity maximum for X coincides with the third order intensity maximum for Y. what is the ratio $\frac{wavelenth\ of\ x}{wavelegth\ of\ y}$? 2013-169 Med: — B
(a) ½ (b) 2/3
(c) 3/2 (d) 2/1

513. When monochromatic light of wavelength 5.0X 10^{-7} m is incident normally on a plane diffraction grating, the second order diffraction lines are formed at angles of 30^0 to the normal to the grating. What is the number of lines per millimeter of the grating? 2013-56 Med: — B — $d=\frac{m\lambda}{\sin\theta}$& $N=\frac{1cm}{d}$
(a) 250 (b) 500
(c) 1000 (d) 4000

514. If the movable mirror is displaced through distance of 0.05mm, 200 fringes are observed shifted. The wavelength of light used is? 2006-07 Med: — C — $d=\frac{n\lambda}{2}$&$\lambda=\frac{2d}{n}=\frac{2\times0.05\times10^{-3}}{200}$ = 5 x 10^{-7}m = 500 x 10^{-9}m = 500nm
(a)5x10^{-10}m (b) 5x10^{10}m
(c) 500nm (d) 50nm

515. Light of wavelength 700nm is incident on pair of slits forming fringes 3.0mm apart on a screen. What is the fringe spacing when light of wavelength 350 nm is used and the slit separation is doubled? 2012-179 Eng: — A — $\Delta y\propto\lambda$, $\Delta y\propto\frac{1}{d}$, $\Delta y\propto D$,. $\Delta y=\frac{\lambda D}{d}$,
(a) 0.75mm (b) 1.5mm
(c) 3.0 mm (d) 6.0 mm

516. When the Nweton's rings interference … is seen from above by means of reflected light. The central spot always appears: 2009-97 Med: — B
(a) White (b) Black
(c)Red (d)Green

517. To obtain greater dispersion by a diffraction grating: 2016-65 Med — D
(a) The slit width should be increased
(b) The slit width should be decreased
(c) The slit separation should be increased
(d) The slit separation should be decreased

Bragg,s Law & Pollarization:

518. The refractive index is equal to the tangent of the angle of polarization. It is called: 2017-Med
A. Brewster's Law B. Malu's Law
C. Bragg's Law D. Grimaldi's Law

519. Which of the following cannot be polarized? 2017-Med
A.Radio waves B. Ultraviolet rays
C. X-rays D.Ultrasonic waves

520. The transverse nature of light is verified with the phenomenon of: 2012-45 Med: — B

(a) Interference (b) Polarization
(c) Diffraction (d) Dispersion

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521. Sound waves cannot be: 2010-169 Eng: 2012-97, 2012-155, 2009-104 Med: — A
(a) Polarized (b)Reflected
(c) Refracted (d) Diffracted

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522. The sound waves and light waves cannot be both; 2014-51 Med: — A
(a)Polarized (b) Refracted
(c) Reflected (d) Diffracted

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523. Polaroid glass is used in sun glasses because: 2016-183Eng — C
(a) It is cheaper
(b) It increases the light intensity to one and a half times on account of polarization
(c) It reduces the light intensity to half its value on account of polarization
(d) It produces irritation in eye

CHAPTER-10: THERMODYNAMICS

Internal Energy ,Law of Thermodynamics

524. How much kinetic energy will be gained by an (alpha) particle ion going from a point at 70 V to an other point at 50 V? 2017-Med — A
A. 40 eV B. 40 KeV
C.40 MeV D. Zero

$\Delta K.E = q\Delta V$
$= 2e \times 20V$
$= 40\ eV$

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525. For all adiabatic processes; 2015-67 Med — A
A) The entropy of the system does not change
B) The entropy of the system increases
C) The entropy of the system decreases
D) The entropy of the system does not decreases

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526. During a reversible adiabatic expansion of an Ideal gas, which of the following is not true? 2015-58Med — d
A) PVT^r = constant B) PV = constant
C) PV = nRT D) TV' .= constant

---

527. The energy absorbed as heat by an ideal gas for an isothermal process is equal to: 2015-59 Med — A
A) The work done by the gas
B) The work done on the gas.
C) Change in the internal energy of the gas
D) Zero, since the process is isothermal

---

528. In an adiabatic process there is no: 2015-48 Med — B
A) Work done B) Exchange of heat C) Change in temperature
D) Change in internal energy

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529. Pressure exerted by perfect gas is equal to:2009-117 Med: — C
(a) 1/3 Mean K.E /volume (b) 1/2 Mean K.E /volume
(c)2/3 Mean K.E /volume (d)Mean K.E /volume

---

530. Which is the correct statement? 2014-81 Med: — C
(a) The average kinetic energy of the molecules depends on volume in which the gas is enclosed
(b) The average kinetic energy of the molecules in the gaseous state is proportional to pressure.
(c) The average kinetic energy of the molecules in gaseous state is proportional to temperature.
(d) All of the above.

531. If an ideal gas is allowed to expand adiabatically the work done by the gas is equal to: 2011-162 Eng: — A
(a) The loss of internal energy (b) The loss of entropy
(c) The rise in temperature (d) The decrease in pressure

532. The process which is performed quickly is: 2011-95 Med: — B
(a) Isobaric process (b) Adiabatic process
(c) Isothermal process (d) Isochoric process

533. The process in which heat neither enters nor leaves the system but still the temperature of the system changes is. 2006-118 Med: — C
(a) Isobaric process (b) Isothermal process
(c) Adiabatic process (d) Isochoric process

534. The internal energy of a fixed mass of an ideal gas depends on: 2014-67 Med: — **D**
(a) Pressure but not volume or temperature.
(b) Temperature but not pressure or volume.
(c) volume but not pressure or temperature.
(d) Pressure and temperature but not volume.

535. Which form of matter possesses higher magnitude of internal energy; 2007-86 Med: — D
(a) Gaseous matter (b) Solid matter
(c) Liquid matter (d) All have the same magnitude

536. Which of the following is a characteristic of an isothermal change? 2010-105 Med: — B
(a) Enthalpy is constant (b) Temperature is constant
(c) Pressure is constant (d) No heat enters or leaves the system

537. In iso-thermal process there is no change in: 2015-171Eng — C
A) Pressure B) Work done
C) Internal energy D) Imaginary numbers

Molar Specific Heat,Reversible & Irreversible Process ,Heat Engine:

538. The amount of heat required to raise the temperature of 10 moles of water from 70K to 80K (molar heat capacity of water 75.24J) is: 2018-Med — D
A)0.752J B)7524J
C)95.24J D)752.4J

$Q = nC\Delta T$
$=10x75.4\ x10=$
7524J

539. 1 mole of an ideal gas was allowed to expand from $20dm^3$ to $30dm^3$ against a constant external pressure 50atm. The work done is equal to:2018-Eng — B
A)50 atm dm^3 B)2500 atm dm^3
C)15 atm dm^3 D)500 atm dm^3

work done at constant pressure = pressure x change in volume
$= P \times \Delta V$
$= 50x10=500$ atm dm^3

540. The amount of heat required to raise the temperature of I Calorie of substance through 1 K is called: 2010-56, 2008-154 Med: — A
(a) Heat capacity (b) 1 Joule
(c)Specific heat (d)One calorie

The **heat capacity** of a defined system is the amount of **heat** (usually expressed in calories, kilocalories, or joules) needed to raise the system's temperature by one degree (usually expressed in Celsius or Kelvin). It is expressed in units of thermal energy per degree temperature.
While;The **specific heat** is the amount of **heat** per unit mass required to raise the temperature by one degree Celsius.

541. A valid sec of units for specific heat capacity is: 2014-27 Eng: — C
(a) Kg J–1k (b) Kg J–1k–1
(c) JK-1Kg-1 (d) Kg $s^{-1}k^1$

Specific heat = $C = \Delta Q / m\ \Delta T$ =JK-1Kg-1

No.	Question	Ans	Explanation
542.	$C_p > C_v$ are because in the case of C_p: 2015-172 Eng A) More heat is required to do the external work B) Heat is needed to do external work C) No heat is required to increase internal energy D) Heat is required to do external work against external volume	D	**Cp**(specific heat at constant pressure) ,**Cv**(specific heat at constant volume). When a gas is heated at const: volume,no external work is done and so the heat supplied is consumed only in increasing the internal energy of a gas. But if the gas is heated at const:pressure , the gas expands against external pressure so does some external work. In this case the supplied heat is used up in increasing the internal energy of the gas and in doing some external work . Thus;$C_p > C_v$
543.	How much heat is absorbed by 100g of water when its temperature decreases from 25^0C to 5^0C? (heat capacity is 4.2j/gk); 2010-127 Eng: (a) 84,000j (b) -2000/4.2j (c) 2000/4.2j (d) -84,00j	D	Q = mcΔT = 100 x 4.2 x (-20) = -8400j,

Second Law of Thermodynamics(Carnot Engine),Refrigerator & Entropy:

No.	Question	Ans	Explanation
544.	A car not engine working between 200k and 400k has a work output of 600 J per cycle. How much heat energy is supplied to the engine from the source of each cycle. 2017-Med A. 1400J B. 1200 J C. 1700J D. 1300 J	B	η = [T1-T2]/T1 = 400-200/400 = 200/400 =0.5 η = ΔW/Q1 → Q1 = ΔW /η = 600/0.5 = 1200J
545.	The efficiency of a heat engine working between the freezing point and the boiling point of water is near to: 2018-Med A)50% B)25% C)12.5% D)6.25%	B	
546.	"The energy change in a closed cycle form initial to final state is zero". This statement is obeyed by: 2018-Eng A)Born Haber cycle B)Law of conservation of energy C)First law of thermodynamics D)All of the above	D	
547.	The first law of thermodynamics is a statement which implies that: 2018-Eng A) No heat enters or leaves the system. B) The temperature remains constant. C) All work is mechanical D) Energy is conserved.	D	
548.	Which thermodynamic temperature is equivalent to 501.85 ^{o}C? 2014-69 Med: (a) 775.00 K (b) 774.85 K (c) 228.85K (d) 228.70 K	B	K = oC + 273 = 501.85oC + 273 = 774.85 K
549.	The statement that heat cannot spontaneously flow from a colder to a hotter body is a result of: 2014-132 Med: (a) Henry's law (b) The first law of thermodynamics (c) The second law of thermodynamics (d) The third law of thermodynamics.	C	
550.	The heat engine operating in reverse is called; 2010-117 Med: (a) Electric generator (b) Refrigerator	B	

(c) Cannot engine d) Electric motor

No.	Question	Ans	Explanation
551.	For all irreversible process, the entropy of the system; 2011-98 Med: (a) decreases (b) remains constant (c) is zero (d) increases	D	
552.	Net change of entropy in the carnot cycle is: 2006-61Med: (a) Zero (b) Positive (c) Negative (d) None of the above	A	As Carnot cycle is a reversible Cycle,so net change of entropy is Zero.
553.	The temperature scale which is independent of the nature of the working substance is: 2010-93 Med: (a) Celsius scale (b) Fahrenheit scale (c) Centigrade scale (d) Thermodynamic scale	D	
554.	Possible units of entropy are; 2015-185 Eng A) J B) J/K C) J^{-1} D) Cal/K	B	
555.	The ratio of universal gas constant to Avogadro number is equal to: 2011-93 Eng: (a) Plank's constant (b) Boltzman's constant (c) Stefan's constant (d) Decay constant	B	
556.	The ratio of the heat accepted to the heat rejected by a car not engine gives: 2009-114 Med: (a) The efficiency of the working substances (b) The ideal gas scale temperature. (c) The thermal conductivity at the working substance. (d) The thermal conductivity of the working substance.	A	
557.	If the temperature of the source of heat increases the efficiency of a carnots engine: 2010-43 Eng: (a) Increases (b) Decreases (c) Remains constant (d) None of these	A	**Efficiency** of Carnot engine, $\eta = (T_2 - T_1) / T_2$ Here is T_1 is for Sink Temperature &T_2 is Sourse Temperature.. Thus;The maximum efficiency of the carnot engine only depends on two factors: **1** - T_1 (Sink Temperature).**2** - T_2 (Sourse Temperature). **Maximum efficiency (100%)** would be when the difference of temperatures between the two reservoirs is infinite.
558.	The efficiency of a Carnot engine, that is operating between a cold reservoir at temperature T_c and a hot reservoir T_h, is dependent upon; 2005-31Med: (a) The heat capacity of working substance (b) Only the temperature of two reservoirs (c) The reservoir temperature and the heat capacity of the working substance (d) The reservoir temperature and the volume change during heat absorption	B	
559.	Which of the following is responsible for an increase in the entropy of a gaseous system? 2010-115 Eng: (a) Increase in heating (b) Cooling the system (c) Heating followed by cooling (d) Compression at specific temperature	A	

560.	A heat engine: 2016-06 Med (a) Converts heat input to an equivalent amount of work (b) Converts work to an equivalent amount of heat **(c) Takes heat in, doeswork, and loses energy as heat** (d) Uses positive work done on the system to transfer heat from a low temperature reservoir to a high temperature reservoir.	C
561.	On a warm day a pool of water trainers energy to the air as heat and freezes. This is a direct violation of: 2016-182 Eng (a) The zeroth law of thermodynamics (b) The first law of thermodynamics (c) The second law of thermodynamics (d) The third law of thermodynamics	B
562.	Joule degree^{-1} is the unit for 2016-162 Eng (a) Solar constant **(b) Boltzmann's constant** (c) Stefan's constant (d) Planck's constant	B

2ND YEAR PHYSICS

CHAPTER-11: ELECTROSTATICS

Coulomb,s Law,

563. There are two charges 1μc and 5μc, the ratio of the force acting on them will be: 2017-Eng
A.1:25 B.1:5
C.1:1 D.5:1
Answer: C

564. In the M.K.S. system of units, ε_0 equals: 2017-Eng
A) $\frac{1C^2}{N-m^2}$ B) $\frac{9\,X10^9\;Nm^2}{C^2}$
C) $\frac{1}{4\pi x\,10^9}\frac{C^2}{Nm^2}$ D) $\frac{1}{9\,x\,10^9}\frac{C^2}{Nm^2}$
Answer: C

565. 7There are two charges +3μC and +8μC, the ratio of the force acting on them will be: 2018-Med
A)3 : 1 B)1: 1
C)11: 8 D)3 : 8
Answer: B

566. The force between two charged bodies is "F". If one of the charge is doubled and the distance between them is halved, the force acting on each charged body is: 2018-Eng
A)2 F B)4 F
C)8 F D)16 F.
Answer: C

567. If the distance b/w the two charged particles is havled, the Coulomb's force b/w them becomes; 2007-50 Med:
(a) Half (b) One quarter
(c) Double (d)Four times
Answer: D
$F=kq_1q_2/r^2$ when r=r/2 then $r^2=(r/2)^2=r^2/4$ then $F=kq_1q_2/r^2/4 \rightarrow 4kq_1q_2/r^2 = 4F$

568. The coulomb's force between the charges in air is 2.0N the coulomb's force between these charges in insulating medium having E_r = 3.8 is: 2011-103 Eng:
(a) 5.26 N (b) 3.8 N
(c) 2.0 N (d) 0.53 N
Answer: D
$F^1 = \frac{F}{Er} = \frac{2}{3.8} = 0.53N$

569. The correct expression for the coulomb's force is: 2011-102 Med:
(a) $\vec{F}^1 = \frac{1}{4\pi\epsilon_o}\times\frac{q_1q_2}{r^2}\vec{r}$ (b) $\vec{F} = \frac{1}{4\pi\epsilon_o}\times\frac{q_1q_2}{r^2}\hat{r}$
(c) $\vec{F} = \frac{1}{4\pi\epsilon}\times\frac{q_1q_2}{r^2}\vec{r}$ (d) $\vec{F}^1 = \frac{1}{4\pi\epsilon}\times\frac{q_1q_2}{r^2}$
Answer: B

570. In 10 minutes 3000 coulomb of free electrons enter one end of a conductor and 3000 coulomb leave the other end. The current is: 2016-32 Eng
(a) 5A (b) 10A
(c) 30A (d) Zero
Answer: A
T= 10 min= 600 sec and q= 3000 col →1=q/t=3000/600=5

571. A charge 'Q' is divided into two parts 'q' and 'Q'q' and separated by a distance 'R'. The force of repulsion between them will be maximum when: 2016-62 Eng
(a) q = Q/4 **(b) q = Q/2**
(c) q = Q (d) q = Q/8
Answer: B
$F = K (q)(Q/2)/r^2 > K (q)(Q/4)/r^2$ and $K (q)(Q)/r^2$ and $> K (Q)(Q/8)/r^2$

Electric Field Intensity,Electric Field lines & Electric Flux (Gauss's Law):

572. Before a thunder stand on end. A hair with mass 0.50 mg and charge 1.0 pc is supported by a force other than the weight of hair and the electric force. What is the electric field strength ? 2017-Eng — C
A. 4.9 x 10^3 NC^{-1} B . 4.9 x 10^5 NC^{-1}
C. 4.9 x 10^6 NC^{-1} D. 4.9 x 10^9 NC^{-1}

573. Charge is distributed uniformly on the surface of large flat plate. The electric field 2cm from the plate is what is the electric field at 4cm from the plate: 2017-Eng — B
A.120 N/C B. 30 N/C
C) 15 N/C D) 7.5 N/C

574. In a uniform electric field, which statement is correct? 2018-Med — D
A)All charged particles experience the same force
B)All charged particles move with the same velocity.
C)All electric field lines are directed towards positive charges
D)All electric field lines are parallel.

575. The number of electrons in one coulomb of charge are: 2018-Med — C
A)6.25x 10^{21} B)1.6 x 10^{19}
C)6.25x 108 D)9.1 x 10

576. What is the magnitude of a point charge N which produces an electric field of $2NC^{-1}$ at a distance of 60 Cm? 2018-Med — A
A) 8x 10^{-11} C
B) 2 x 10^{-12} C
C) 3 x 10^{-11} C
D) 6 x 10^{-18} C

$E=kq/r^2$
$\rightarrow q=Er^2/k$
$= 2x(0.6)^2 /9 \times 10^{-9}$
$= 8 \times 10^{-11}$ C

577. Two electrically neutral materials are rubbed together. One acquires a net positive charge. 2018-Eng — B
A)Lost electrons B)Gained electrons
C)Lost protons D)Gained protons

578. If $\frac{\Delta v}{\Delta r}$ is potential gradient, then the intensity of electric field at a point is; 2015-69 Med — C
A) $\frac{\Delta v}{\Delta r}$ B) q $\frac{\Delta v}{\Delta r}$
C) -$\frac{\Delta v}{\Delta r}$ D) $\frac{\Delta x}{\Delta r}$

The negative sign shows that work done on q_0 is against the field.

579. The unit of the electric field is: 2015-77 Med — D
A) N/C B) V/m
C) J/C.m D) All of the above

E=F/q=N/c and E=V/r=V/m also F/q=W/d/q=W/dq=J/C

580. An electric current of 1 A is passing through a cross section of the coil in 1 second. How many electrons are involved in providing a current of 1A? The charge on 1 electron is 1.602×10^{-19} C. 2012-55 Med:, 2012-110 Eng: — D
(a)3.21×10^{18} (b) 2.2×10^{16}
(c) 1.602×10^{19} (d)6.42 × 1018

$I = \frac{Q}{t} = \frac{ne}{t}$ & $n = \frac{It}{e} = \frac{1\times1}{1.602\times10^{-19}}$
$= 6.42 \times 10^{18}$

581. The electric field at a certain distance from an isolated alpha particle is 3.0×10^7 N C^{-1}. What is the force on an electron when at that distance from the alpha particle? 2012-176 Eng — D
(a) 4.8×10^{-12} N (b) 2.6×10^{12} N
(c) 3.0×10^7N (d) 6.0×10^7 N

$E=F/q \rightarrow F = qE = 1.6\times10^{-19} \times 3.0\times10^7 = 4.8\times10^{-12}$N,

582. The unit of electric intensity is 2009-101 Med:
(a) Volt/meter (b) Newton / Columb
(c) $\frac{joule}{coulomb - meter}$ (d) All of the above
D — E=F/q=N/c and E=V/r=V/m also F/q=W/d/q=W/dq=J/C

583. The rate of change of electric potential with respect to displacement is equal to: 2011-106 Eng:
(a)Potential gradient (b)Electric potential energy
(c) electric intensity (d) Electric flux
A

584. The negative gradient of electric potential is also called: 2012-101 Med:
(a)Potential energy (b)Electric field intensity
(c)Electric potential difference (d) Electron volt
B

585. In the direction indicated by an electric field line: 2014-23Med:
(a) The potential must increase
(b) The potential must decrease
(c) The electric field strength must increase
(d) The electric field strength must decrease
B

586. The electric field between the plates of an isolated air-spaced parallel- plate capacitor is E. What is the field between the plates after immersing the capacitor in a liquid of relative permittivity 10? 2014-189 Med:
(a) $\sqrt{10}$ E (b) E/$\sqrt{10}$
(c) 10E (d) $\frac{E}{10}$
D — Electric Field in Medium = $\frac{E}{Er}$ = $\frac{E}{10}$

587. If a soap bubble is charged: 2012-153 Med:
(a) Its size decreases (b) Its size increases
(c)No change (d)None of them
B — Because same charge repel and size increases

588. A close surface contains equal and opposite charges. The net electric flux through the close surface is; 2007-161 Med:
(a) Maximum (b) Minimum
(c) Zero (d) Positive as well as negative
C

589. Two point particles, one with charge +8 × 10^{-9}C and the other with charge –2 × 10^{-9}C, are separated by 4m. The electric field in N/C midway between them is: 2016-121 Eng
(a) 9 × 10^{9} (b) 13, 500
(c) 36 × 10^{-9} **(d) 22.5**
D

590. When will 1C of charge pass a point in an electrical circuit? 2016-72 Eng
(a) When 1A moves through a voltage of 1V
(b) When a power of 1W is used for 1s
(c) When the current is 5mA for 200s
(d) When the current is 10 A for 10s
C — 1=Q/t→ Q=It→5mA x 200s= 0.005 x 200 = 1.000

ELECTRIC POTENTIAL & ENERGY,POTENTIAL GRADIENT,ELECTRON VOLT:

591. Which one of the following is correct? 2017-Eng
a) joule = coloumb/volt
b) joule =volt x ampere
c) joule = volt /ampere
d) joule = coloumb x volt
D — V = W/q
W = qV
Joule = coloumb x volt

592. A proton is about 1840 times heavier than an electron. When it is accelerated by a potential difference of IkV, its kinetic energy will be; 2017-Eng

A.1840 keV B. 1/1840 keV
C.1 keV D.920 keV

C

K.E = eV
Energy depends upon charge not mass so same for proton and electron
K .E = eV = 1 KVe = 1keV

---

593. Two copper wires S and T of equal lengths are connected in parallel. A potential difference is applied across the ends of this parallel arrangement. Wire S has a diameter of 3.0 mm. Wire T has a diameter of 1.5 mm. What is the value of the ratio $\frac{current\ in\ T}{current\ in\ S}$? 2017-Eng

A. 1/4 B.1/2
C. 2 D. 4

A

---

594. A pedal bicycle is fitted with an electric motor. The rider switches on the motor for a time of 3.0 minutes. A constant current of 3.5 A in the electric motor is provided from a battery with a terminal voltage of 24 V. What is the energy supplied by the battery? 2017-Eng

A.84J B .250
C.630 J D.15000J

D

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595. An electron volt is a unit of: 2018-Eng

A)Electric potential B)Charge
C)Electric current D)Energy

D

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596. The particle carrying a charge of (2e) falls through a potential difference of 3V. Energy required by the particle is: 2009-11 Med:

(a) $9.6\times10^{-19}J$ (b) $1.6\times10^{-19}J$
(c) $3.2\times10^{-19}J$ (d) $6.9\times10^{-19}J$

A

U=Energy = qV= neV= $2\text{x}1.6\text{x}10^{-19}\text{x}3 = 9.6\text{x}10^{19}$J

---

597. The Potential gradient between the two charged plates having, separation of 0.5cm and potential difference of 12volts is:2011-105 Med:

(a) 240 NC^{-1} (b) 24 NC^{-1}
(c) 2.4 NC^{-1} (d) 2400NC^{-1}

D

E = $\frac{\Delta v}{\Delta r}$ = $\frac{12V}{0.005\ m}$ = 2400 Nc^{-1}

---

598. The potential difference between two points is one volt. The work done in moving one coulomb of charge from on point to other point is: 2010-183 Eng:

(a) One erg (b) One foot pound
(c) One electron golt (d) One joule

D

1Volt = $\frac{1Volt}{1coulomb}$ ⇒1 Joule = 1voltx 1 coulomb

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599. Which physical quantity would result from a calculation in which a potential difference is multiplied by an electric charge? 2012-81 Eng:

(a) Electric current (b) Electric field strength
(c) Electric power (d) Electric energy

D

U (Energy) = q × v

---

600. An electron when accelerated through a potential difference of one volt will gain an energy equal to; 2007-137 Med

(a) One erg (b) One joule
(c) One electron volt d) One watt sec

C

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601. If an electron is accelerated from rest through a potential difference of 100 volts. Its final kinetic energy is: 2009-141 Med:

(a) $1.6\times10^{-18}J$ (b) $1.6\times10^{17}J$

D

K.E = qv = $1.6 \times 10^{-19} \times 100$ = 1.6×10^{-17}J = $\frac{1.6x10^{-17}}{1.6x10^{-19}}$ = 100 electron Volt

(c) 100 J (d) 100 electron Volt

No.	Question	Ans	Explanation
602.	A total charge of 100C flows through a 12W bulb in a time of 50 second. What is the potential difference across the bulb during this time? 2016-75 Med (a) 0.12V (b) 2.0V **(c) 6.0V** (d) 24V	C	**P=IV=$\frac{Q}{t}$V Thus;V=$\frac{P}{Q}$t =** **P=IV=$\frac{12x50}{100}$ =6V**
603.	An electron has charge-e- and mass m. A proton has charge e and mass 1840m. A "Proton volt" is equal to: 2016-137 Med **(a) 1 eV** (b) 1840 eV (c) (1/1840) eV (d) $\sqrt{1840}\ eV$	A	Electron volt and proton volt value will be same because it depends on charge

Capacitor,Charging & Discharging a Capacitor:

No.	Question	Ans	Explanation
604.	Two identical capacitors each with capacitance C are connected in parallel and the combination is connected in series to their identical capacitor. The equivalent capacitance of this arrangement is: 2017-Eng A. 2C/3 B.C C.2C D.3C	A	
605.	To determine the resistance of a voltmeter by discharging a capacitor through it, the instantaneous voltage is then given by the relation: 2018-Med A)$V_0e^{-t/RC}$ B)$V_0e^{t/RC}$ C)V_0^2 D) $V_0/\sqrt{2}$	A	For discharging=q=q$e^{-t/RC}$ (Dividing by C) So;q/C= qo/C($e^{-t/RC}$)V=$V_oe^{-t/RC}$
606.	The energy stored in a charged capacitor is given by: 2018-Med A. $\frac{1}{2}$ QV B. $\frac{1}{2}$ C^2V^2 C. $\frac{1}{2}$ CV D. $\frac{1}{2}$ QV^2	A	
607.	A battery is permanently connected to a parallel plate capacitor and the energy stared is x joules. When one plate is moved so that separation of the plate is doubled, the energy now stored in joule is: 2015-68 Med A) 4x B) 2x C) x/2 D) x/4	C	U = x = C V^2/2=(A$\in_0\in$/d)(V^2/2) Put d=2d As U ∝ 1/d,If "d" become doubled than energy will be become half
608.	the quantity ½ $\in_0\in rE^2$ has the significant of; 2015-79 Med A) energy/farad B) Energy/ coulomb C) Energy/ volume D) energy/volt	C	Energy/volume = ½ $\in_0\in rE^2$
609.	The correct expression for the energy of the charged capacitor is: 2011-109 Eng: 2013-103 Med (a) $\frac{1}{2}C^2V$ (b) $\frac{1}{2}\frac{Q^2}{C}$ (c) $\frac{1}{2}\frac{V^2}{C}$ (d) $\frac{1}{2}C^2V^2$	B	Energy in capacitor =$\frac{1}{2}QV$ = $\frac{1}{2}\frac{Q^2}{c}$=$\frac{1}{2}CV^2$
610.	The charge on electron is equal to: 2009-118 Med: (a) 1.7588×10^{19} *Coulomb* (b) 1.6022×10^{-19} *Coulomb* (c) 1.2057×10^{19} *Coulomb* (d) 0.6022×10^{19} *Coulomb*	B	The charge on electron is 1.6022 $\times10^{-19}$ *Coulomb*

611. Three capacitors of capacitance 2 μF each are connected in series to a power supply of 6 volt. The voltage across each capacitor is: 2008-146 Med:
(a) 6 volt (b) 1 volt
(c) 3 volt (d) 2 volt

D

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612. The ratio of the capacitance of the capacitor having dielectric to the capacitance of the capacitor having free space is the dielecaric: 2010-67 Med:
(a) Relative permittivity (b) Permittivity
(c) Permeability (d) Electric polarization

A — Er = Cmed/Cvac

---

613. The capacitor which charges and discharges quickly will have.
(a) Small value of RC (b) Large value of RC
(c) Large value of time constant (d)None of these

A — Smaller value of time const: Rc leads to more discharge

---

614. Ohm×farad is equivalent to: 2011-108 Med:
(a) Second (b) Weber
(c) Henry (d) Tesla

C — Henry is unit of RC → Henry = oh m farad

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615. Which of the following is the same unit as the farad? 2014-34 Med:
(a) Ωs (b) Ωs^{-1}
(c) Ω^{-1} s D) $\Omega^{-1} s^{-1}$

C — RC is unit constant and its unit is seond so RC=s →C=sec/R = s /Ω= Ω^{-1} s

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616. A capacitor which has a capacitance of 1 farad will: 2014-122 Med:
(a) E fully charged in 1 second by a current of 1 ampere.
(b) Store 1 coulomb of charge at potential difference of 1 volt.
(c) Gain 1 joule of energy when 1 coulomb of charge is stored on it.
(d) Discharge in 1 second when connected across a resistor of resistance 3 ohm.

B

---

617. The potential difference between a pair of similar. Parallel conducting plates is known. What additional information is needed in order to find the electric field strength between the plates? 2014-120 Med:
(a) Separation of the plates.
(b) Separation and dres of the plates.
c) Permitivity of the medium separation of the plates.
(d) Permitivity of the medlum separation and area of the plates.

A

---

618. A battery is marked 9.0V. What does this mean? 2014-62 Med:
(a) Each coulomb of charge from the battery supplies 9.0J of electrical energy to the whole circuit.
(b) The battery supplies 9.0J to an external circuit for each coulomb of charge.
(c) The potential difference across any component connected to the battery will be 9.0V.
(d) There will always be 9.0V across the battery terminals

C

---

619. A charged capacitor stores 10 C at 40 V. Its stored energy is: 2016-93 Med
(a) 400 J (b) 4 J
(c) 0.2 J **(d) 200 J**

D — $U=\frac{1}{2}QV=\frac{1}{2}10 \times 40=200$ **J**

---

620. The time constant RC has units of: 2016-121 Eng
(a) Second/farad (b) Second/ohm
(c) 1/second **(d) None of the above**

D — RC is unit constant and its unit is second

621. A 35-μF capacitor is connected to a source of sinusoidal emf with a frequency of 400 Hz and a maximum emf of 20 V. The maximum current is: 2016-133= Eng — C
(a) 0 (b) 0.28 A
(c) 1.8 A (d) 230 A

CHAPTER-12: CURRENT ELECTERICITY

STEADY CURRENT,OHM,S LAW

622. Three bulbs of rating 60w, 80W and Tow are connected in series to work on 240 V which bulb will glow most brightly: 2018-Eng — A
A)60 W B)80 W
C)100W D)All will bun equally bright.

623. A thermistor is a semiconductor device whose resistance: 2018-Eng — A
A)Decreases as its temperature increase
B)Doesn't vary as its temperature increases
C)Decreases as its temperature decreases
D)Doesn't vary as its temperature decrease

624. There is a current of 3.2 amps in a conductor. The number of electrons that cross any section normal to the direction of flow per second is: 2017-Eng — A — I=q/t=ne/t → n=It/e=3.2 x 1 /1.6 x 10^{-19} =
A.2x 10^{19} B.0.2 x 10^{19}
C.20 x 10^{19} D.200 x 10^{19}

625. The example of a non-ohmic resistance is: 2017-Eng — A
A.Ge-resistance B.Carbon resistance
C.Copper wire D. Diode

626. A student kept her 60 watt and 120 volt study lamp turned on from 2:00 PM until 2:00 AM. How many coulombs of charge went through it? 2017-Eng — C — Q=It=(P/V)t=(60/120)x(12x3600)=21600
A.3600 B.7200
C.18000 D.21600

627. Two lamps are connected in series to a 250 V power supply. One lamp is rated 240 V, 60 W and the other rated 10 V, 2.5 W. Which statement most accurately describe what happens? 2017-Med — D
A. Both lamps light at less than their normal brightness.
B. Both lamps light at their normal brightness.
C. Only the 240 V lamp lights.
D. The 10 V lamp blows.

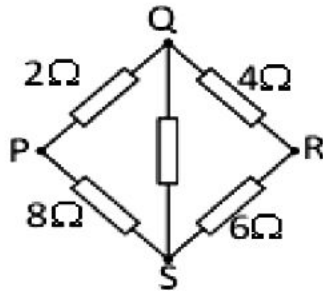
628. For ohmic substance, the electron drift velocity is proportional to: 2015-87 Med — A — Larger the cross-sectional area lesser will be the resistance
A) Cross sectional of the sample
B) The length of sample
C) The mass of an electron
D) The electric field in the sample

629. Ampere hour is a unit of: 2009-131 Med: — C — $I = \frac{Q}{t} \Rightarrow Q = I \times t$ = ampere hour → (Ampere x time)
(a) Current (b) Time
(c) Quantity of charge (d) Power

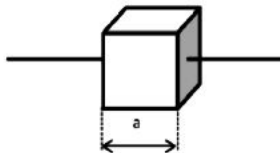
630. A student measures a current as 0.5A. Which of the following correctly expresses this result? 2012-144 Eng:
(a) 50mA (b) 50MA
(c) 500MA (d) 500 mA
D
0.5 A= 0.5 mA/m = $0.5/10^{-3}$ mA = 0.5 x 10^3 mA = 500 mA

631. Which of the following are Ohmic materials? 2012-167, 2008-87, 2013-99 Med:
(a)Semiconductors (b)Tungsten filament
(c)Thermistor (d)Metals
D
Metals are ohmic material.

Electrical Resistance,Resistivity & Conductivity:

632. Four resistors are connected in a square as shown
B

The resistance may be measured between any two junctions. Between which two junctions is the measured resistance greatest? 2018-Med
A)P and Q B)Q and S
C)R and S D)S and P

633. The reciprocal of the conductance is called: 2018-Med
A) Conductivity B)Resistivity
C)Resistance D)Inductance
C

634. A metal cube with sides of length "a" has electrical resistance R between opposite faces
C

What is the resistance between the opposite faces of a cube of the same metal with sides of length 3a? 2018-Med
A) 9R B) 3R
C) R/3 D) R/9

635. A filament lamp has a resistance of 180Ω when the current in it is 500 mA. What is the power dissipated in the lamp? 2018-Med
A)45 W B)90 W
C)290 W D)360 W
Hints: $P=IV=I^2 R=(0.5)^2 \times 180=45W$
A

636. Wire a has the same length and resistance a wire B. the diameter of A is double that of B. what is the ratio of the resistivity of wire A to that of wire B? 2018-Eng
A) 1:2 B)4 : 1
C) 1:4 D)2: 1
Hints: $\rho1/\rho2=A1/A2=d_1^2/d_2^2=(2B)^2/B^2 = 4/1 = 4:1$
B

No.	Question	Ans	Explanation
637.	Three resistors of resistances 20Ω, 4Ω and 6Ω are connected in parallel across a D.C supply. The ratio of the current through the 2Ω resistor to the current through the 4Ω resistor is: 2018-Eng A)I: 2 B)2:1 C)1:4 D)1 : 6	B	
638.	Four 20 Ω resistors are connected in parallel and combination is connected to a 20 V emf device. Thecurrent in the device is: 2015-97 Med A) 0.25 A B) 1.0 A C) 4.0 A D) 5.0 A	C	$\frac{1}{Req}= \frac{1}{R1}+\frac{1}{R2}+\frac{1}{R3}+\frac{1}{R4}$, *Hence* Req=5Ω and $I=\frac{V}{R}=\frac{20}{5}$= **4.0 A**
639.	Several resistors are connected in parallel the resistance of their equivalent resistor will: 2014-99: Med a) Increase b) Decrease c) Not change d) None of these	B	$\frac{1}{Req}=\frac{1}{R1}+\frac{1}{R2}+\frac{1}{R3}+\cdots..+\frac{1}{Rn}$ =Req is decreased
640.	What is the current in a 2 x 10^6 ohms resistor having a potential difference of 6 x 10^3 volts? 2005-43 Med: (a) 1 x 10^{-3}A (b) 2 x 10^{-3} A (c) 3 x 10^{-3} A (d) 4 x 10^{-3} A	C	$I=\frac{v}{R}=\frac{6\times6\times10^3}{2\times10^6}=3\times10^{3-6}A=3\times10^{-3}A$
641.	A 50Ω resistance wire is stretched such that its length is doubled and its cross section area becomes half. The new resistance is: 2008-195 Med: (a) 100Ω (b) 200 Ω (c) 50Ω (d) 150 Ω	B	We know that R=ρL/A making L → 2L and A → A/2 the R becomes =ρ 2L/A/2 = =2 x 2 ρL/A =4ρL/A =4R. 4 x 50 = 200Ω
642.	A wire of uniform cross section A, length 1 and resistance R is cut into two equal pieces. The resistivity of each piece will be: 2011-112 Med: (a) The same (b) One fourth (c) Double (d) One half	A	Resistivity depends on nature of material not on its dimesntion
643.	A cylindrical wire 4.0m long has a resistance of 31Ω and is made of metal of resistivity 1.0×10^4Ωm. What is the radius of cross section of the wire? 2012-117 Eng: (a) 1.0×10^{-4} m (b)2.0×10^{21} m (c) 6.4×10^8 m **(d) 2.0×10^{-4} m**	D	R= ρL/A = ρ L/π r^2 →r^2 = ρL/πR putting values $r^2 = 1.0\times10^4$ x 4/3.14 x 32
644.	The unit of conductance is; 2007-169 Med: (a) Ohm (b) Ohm-meter^{-1} (c) Ohm-meter (d) mho	d	The unit oc resistance is opposite to that of resistance conductance = 1/ohm= ohm^{-1} = mho
645.	The resistance of a conductor having a length of one meter and an area of cross section one square meter is called 2011-113 Eng: (a) Conductance (b) Resistivity (c) conductivity (d) mho	B	
646.	Two metallic conductors have the same value of resistivity. These conductors can be differentiated from the values of their: 2011-115 Med: (a) Temperature coefficient (b) resistances (c) conductance (d) conductivity	A	
647.	Two wires P and Q have resistances R_P and R_Q respectively. Wire P is twice as long as wire Q and has twice the diameter of wire Q. the wire are made of the same material. What is the ratio R_P / R_Q?2012-136Eng (a) 0.5 (b) 1 (c) 2 (d) 4	A	$R_p : R_q = \frac{1}{2} : 1 = 1 : 2 = \frac{1}{2} = 0.5$
648.	Several resistors are connected in parallel the resistance of their equivalent resistor will: 2010-04 Eng:	B	$\frac{1}{Req}=\frac{1}{R1}+\frac{1}{R2}+\frac{1}{R3}+\cdots..+\frac{1}{Rn}$

No.	Question	Ans	Explanation
	(a) Increases (b) Decreases (c) Not change (d) None		=Req is decreased
649.	The resistances of 3 ohm 4 ohm and 5 ohm are connected in parallel if the potential difference across 3 ohm resistor be 12 volt then the potential difference across 4 ohm and 5 ohm will be: 2010-109 Eng: (a) 3volt (b) 6volt (c) 9 volt (d) 12 volt	D	In parallel voltage remain same
650.	Two heating coils X and Y of resistance R_x and R_y respectively deliver the same power when 12V is applied across x and 6V is applied across y. what is the ration of R_x/R_y=? 2012-172 Eng: (a) ¼ (b) 6 (c) 2 (d) 4	d	Px : Py $\frac{v^2}{Rx}:\frac{v^2}{Ry} = \frac{(12)^2}{Rx}:\frac{(6)^2}{Ry} = \frac{144}{Rx}:\frac{36}{Ry} \Rightarrow \frac{Rx}{Ry} = \frac{144}{36} = 4$
651.	Three equal resistors connected in parallel have equivalent resistance R/3. When they are connected in series then the equivalent resistance is: 2013-96 Med: (a) R/3 (b)R (c)2R (d) 3R	D	**Req:** (In Series) = R+R+R= 3R
652.	The resistors of 5Ω, 4Ω and 3Ω are connected in parallel. If the potential difference across 4Ω resistor is 6 volt, then the potential difference across 5Ω and 3Ω will be: 2011-116 Eng: (a) 6 volt (b) 3 volt (c) 12 volt (d) 9 volt	A	In parallel voltage remain same while in series the current remains same
653.	A wire of resistance 4Ω is bent into a circle. The resistance between the ends of a diameter of the circle is: 2014-21; Med (a) 4Ω (b) 1 Ω (c) 1/4 Ω (d) 1/16 Ω	B	
654.	A wire of resistance 3.0 Ω is stretched to twice its original length. The resistance of new wire will be: 2014-12;Med (a) 1.5 Ω (b) 3.0 Ω (c) 6.0 Ω (d)32.0	C	
655.	By how many times does doubling the diameter of a wire and making it 10 times longer increase its resistance? 2014-196 Med: (a) 2.5 times (b) 5 times (c) 10 times (d) 30 times	A	
656.	A student connect a 6 volt battery and a 12 volt battery in series and then connects this combination across a 10Ωresistor. What is the current is the resistor? 2014-164: Med a) 0.8 A b) 1.8 A c) 0.9 A d) 2.6 A	B	**In series the voltage are added,Hence the net voltage will be =6V+12V=18V** **Thus; I=V/R =18/10=1.8A**
657.	The resistance of three arms of the balanced wheat stone bridge are 50 ohm. The resistance in the 4th ohm: 2007-193 Med: (a) 25ohm (b) 50 ohm (c) 75 ohm (d) 100 ohm	B	
658.	Conductivity is: 2015-48 Eng A) The same as resistivity B) Expressed in Ω^{-1} C)Equal to 1/ resistance D) Expressed in $(\Omega\text{-m})^{-1}$	D	Conductivity=$\sigma = \frac{L}{RA}$
659.	If the potential difference across a resistor is doubled: 2016-24 Med **(a) Only the current is doubled** (b) Only the current is	A	

No.	Question	Ans	Explanation
	halved (c) Only the resistance is doubled (d) Only the resistance is halved		
660.	The temperature coefficient of resistance of a semiconductor is: 2016-159 Med (a) Positive **(b) Negative** (c) Imaginary (d) Zero	B	
661.	A certain wire has resistance R. Another wire, of the same material, has half the length and half the diameter of the first wire. The resistance of the second wire is: 2016-191 Eng (a) R/4 (b) R/2 **(c) R** (d) 2R	c	

Emf,Kirchoff,s Law,Wheatstone Bridge & Potentiometer:

No.	Question	Ans	Explanation
662.	The resistance of a device is designed to change with temperature. What is the device? 2017-08Med A)A light dependent resistor B)A potential divider C)A semiconductor diode D)A thermistor	D	
663.	When will 1 C of charge pass a point in an electrical circuit? 2017-16 Med A) When 1A moves through a voltage of 1V B) When a power of NOW is used for 1s C) When the current is 5mA for 200s D) When the current is 10A for 10s	C	$Q=It = 5 \times 10^{-3} \times 200 = 1C$
664.	A cell of internal resistance 2.0Ω and electromotive force (e.m.f) 1.5V is connected a resistor of resistance 3.00. What is the potential difference across the 3.02Ω resistor? 2017-17 Med A) 5V B) 1.2V C) 0.9V D) 0.6V	C	I = V / R+r = 1.5/3+2 = 3/10 = V =IR = 3 x [3/10] = 9/10 = 0.9 volt
665.	When we are measuring the internal resistance of a cell by potentiometer, the emf of the battery must be greater than the: 2018-Med A)emf of the cell B)P.D in the circuit C)Current in the cell D)Current in the circuit	A	
666.	A typical mobile phone battery has an e.m.f.of 5.0 V and internal resistance of 200 m Ω, what is the terminal P.D. of battery when it supplies current of 500 mA? 2018-Med A)4.8 V B)4.9 C)S.O V D)5.1 V	B	I = V / R+r → Emf=I(R+r) E= IR+Ir = V +Ir = Thus V=E-Ir = 5-0.1 = 4.9
667.	Kirchhoff's first law is based upon law of conservation of 2018-Eng A)Charge B)Energy C)Mass D) Momentum	A	First law = KCL →I=Q/t →Q =law of conservation of charge
668.	A generator produces 100 KW of power at a potential difference of 10kV. The power is transmitted through cables of total resistance of 5Ω. How much power is dissipated in the cables? 2018-Eng A)50 W B) 250 W C)500 W D)1000 W.	C	
669.	The total driving force of the battery to draw current through a circuit is called: 2011-118 Med: (a) voltage of battery (b) power of battery (c) Emf of battery (d) all of these	D	

No.	Question	Ans	Explanation
670.	The circuit in which the terminal voltage of the battery is equal to the emf of the battery is the: 2011-119 Eng: (a) open circuit (b) close circuit (c) short circuit (d) electric circuit	A	In open circuit the terminal voltage of the battery is qual to the battery.
671.	Kirchoff's first law is based upon law of conservation of: 2012-29 Eng: (a) charge (b) energy (c) mass (d) momentum	A	Kirchoffs first law is based on law of conservation of charge and kirchoffs second law is based on law of conservation of energy.
672.	Potentiometer is the instrument works on the principle of: 2009-57 Med: (a)Kirchhol's 1st law (b) Wheatstone bridge (c)Combination of resistance (d)Kirchhoff's 2nd law	B	Potentiometer is based on principle of wheatstone bridge.
673.	The birds sitting on an overhead transmission line suffer no harmful effects because: 2012-191 Med: (a)Their bodies have high resistance (b)Their feet are good insulators (c)There is negligible potential difference between their feet (d)Wires are insulated	C	There is negligible potential difference between their feet and wire so no flow of current occurs.
674.	Which of the following is not vector quantity? 2012-75 Med: (a) E.F. Intensity (b) G.F. Intensity (c) Magnetic Induction (d) Emf	D	
675.	Which of the following pairs have the same units and dimensions. 2012-182 Med: (a) Resistance and Resistivity (b) Conductivity and Resistivity (c) Emf & P.D (d) Resistivity and Temp co-efficient of resistivity	C	Emf and potential difference both have same unit and dimensiton.
676.	A current of 20.0A flows through a battery with an emf of 6.20 V. If the internal resistance of the battery is 0.01Ω, what is the terminal voltage? 2014-01 Med: (a) 6.40V (b) 31.0V (c) 1.24V (d) 6.00V	D	Vt = E-IR =6.20-0.01(20)=6.00V
677.	Four wires meet at a junction. The first carries 4A in to the junction, the second carries 5A out of the junction, and third carries 2A out of the junction. The fourth carries: 2015-89 Med A) 7A out of junction B) 7A into junction C) 3A out of junction D)3A into the junction		According to KCL i.e I1+I4=I2+I3
678.	Thermocouples covert: 2016-21 Eng (a) Chemical into electrical energy **(b) Heat into electrical energy** (c) Mechanical into electrical energy (d) Light into electrical energy	D	In thermocouples heat energy is converted into electrical energy.
679.	If two bulbs of 25W and 100W respectively, each rated at 220 volts are connected in series with the supply of 440 volts. Which of the bulb will fuse? 2016-31 Eng (a) 100W bulb **(b) 25 W bulb** (c) Both (a) & (b) (d) None of the above	B	

Chapter-13: ELECTROMAGNETISM

Magnetic Field,Magnetic Flux & Ampere,s Law:

No.	Question	Ans	Explanation
680.	An electron and a proton enter a magnetic field with equal velocities which one of them experiences more force: 2018-Med A)Electron B)Proton C)Both experience same force D) Cannot be predicted	C	F = qvb sinθ, the force depend on the charge not on the mass. So both will experience same force.
681.	An electron is projected horizontally from south to north in uniform horizontal magnetic field acting from west to east. The direction along which it will be deflected is: 2018-Med A)Northwards B)Southwards C)Vertically upwards D) Vertically downwards	C	
682.	The force "F" on a charged "q". moving with velocity "v", parallel to magnetic field "B" is given by: 2018-Eng A)F=qvb B) F=Qe C) F = 0 D)F= ILB	A	F= qvbsin θ → here θ = 0 so sin 0 = 0 → qvb (0) = 0
683.	Keeping magnetic field B and velocity of the particles same, which particle will show the most deflection when passes through the magnetic field: 2018-Eng A)β-particles B) α-particles C)γ-rays D)Neutrons	A	Beta particle contain 2 electrons and 2 neutron so it has more charge and F is directly proportional to the charge.F =qvbsinθ
684.	The SI unit of magnetic flux density is:2018-Eng A)$N A^{-1} m$ B)$N A^{-1} m^{-1}$ C)$N A m^{-1}$ D)N A m	B	Φ = BA = [F/IL][A] = [N /A m] [m^2] = N/Am = webr
685.	In a magnetic field the charge at rest experiences: 2018-Eng A)No force B)Maximum force C) Minimum force D)Perpendicular force	A	Magnetic field is due to charge in motion, if charge is entered to magnetic field it will experience a force but if it is rest, it will no experience any force
686.	The charged particle is situated in a region of space and it experiences a force only when it is in motion. It can be deduce that the region encloses; 2015-108 Med A) Both electric and magnetic field B) Both magnetic and gravitational field C) A magnetic field only D) An electric field only	C	If there were electect field charge particle will experience a force even in rest.
687.	If the direction of initial velocity of the charged particle is neither along nor perpendicular to that of magnetic field then the orbit will be: 2015-109 Med A) Circle B) Helix C) Ellipse D) Straight line	B	When θ is b/w 0^0 & 90^0 the perpendicular component will rotate charge particle in circle and horizontal component will move charge ahead so helix will be followed.
688.	A 0.01A moving coil meter of 5 Ω resistance can be converted in in to a 0-2A meter by a resistance Rwith the meter when R is: 2015-99 Med A) 0.025 Ω in parallel B) 0.025 Ω in series C) 0.050 Ω in parallel D) 0.050 Ω in series	A	Rs = $\frac{IgRg}{I-Ig}$
689.	If the streams of protons moves parallel to each other in the same direction, then they: 2015-50 Eng A) Repel each other B) Attract each other C) Doesn't exert force on one anther	B	If protons move in same direction, their magnetic field in their centre are in ooposite direction so they cancel the effect of each other and they will attract each other. On the

No.	Question	Ans	Explanation
	D) Get rotate		other hand if they move in opposite direction they will repel each other.
690.	Two metallic wires are lying parallel. If the current in these wires be flowing in the same direction, the wires will: 2011-122 Med: (a) Attract each other b) Repel each other (c) Have no force of attraction or repulsion (d) Remain stationary	A	
691.	If the current in parallel conductor be flowing in opposite direction then two conductor will 2011-123 Eng: 2006-70 Med: (a) Attract each other (b) Repel each other (c) Neither attract nor repel each (d) None of these	B	If the currect flows in opposite attraction the magnetic field in their centre will be in same direction in their cetre so they will attract each other and if the currect flows in same direction, they will attrach each other because magnetic filed direction will be opposite in their centre.
692.	A wire loop is placed in a magnetic field. The magnetic flux passing through the loop is minimum when the angle between the field lines and the normal to the surface area of the wire loop is: 2012-106 Eng: (a) 0^0 (b) 45^o (c) 90^o (d) 270^o	C	$\phi = B.A = BA \cos\theta = BA \cos 90^0 = 0$
693.	The SI unit of magnetic flux is weber which is equal to: 2011-125 Med: (a) NmA^{-1} (b) Nm^2A^{-1} (c) NAm^{-1} (d) NmA^{-2}	A	magnetic flux = BAcosθ= FA/IL= Nm^2/A m =Nm/A
694.	Which derived unit below is equivalent to the SI unit for magnetic field strength, the tesla, T? 2013-168 Eng, 2014-10 Med: (a) Nm/A (b) NA/m (c) N/Am (d) Am/N	C	
695.	The time rate of change of magnetic flux has the same dimensions as that of: 2012-42, Med: A) Current B) Resistance C) Magnetic induction D) Potential difference	D	
696.	The force exerted on a wire of length one meter carrying a current of one ampere lying normal to magnetic field is called; 2010-124 Med: (a) Magnetic flux (b) Magnetic flux density (c) Magnetic permeability (d)None of these	B	
697.	The magnetic field due to current in solenoid can be increased by; 2011-126 Eng: (a) Increasing the number of turns (b) using soft iron core (c) Increasing the current (d) all of these	D	
698.	When a charged particle enters a uniform magnetic field, there is a change in: 2012-135 Med: (a) Kinetic energy (b)Magnitude of velocity (c) Direction of velocity (d)All of these	C	
699.	If a stationary electron is subjected to a uniform magnetic field it will be: 2013-102 Eng: (a) Unaffected (b) Accelerated in the direction of field	A	

	(c) Caused to move in a circular path (d) Caused to oscillate about a fixed point		
700.	Which derived unit below is equivalent to the SI unit for magnetic field strength, the tesla, T? 2014-10 Med: (a) Nm/A (b) NA/m (c)N/Am (d) Am/N	C	
701.	Which type of field is present near a moving electric charge? 2009-137 Med: (a) An Electric field only (b)A magnetic field only (c) Both magnetic and electric field (d) Magnetic and gravitational field	C	
702.	A wire of length 10 cm lying normal to magnetic field of 0.5T is experiencing a force of 5N. The current in the wire is; 2010-184 Med: (a) 10A (b) 50A (c) 100A (d) 500A	C	F= ILB → $I = \frac{F}{LB} = \frac{5}{0.5\times0.1} = \frac{5x100}{5}$ = 100A,
703.	Two long parallel wires x and y carrying a current of 3A and 5A respectively. The force per unit length experienced by x is 5×10^{-5}N to the right, the force per unit length experienced by wire y is: 2015-107 Med A) 2×10^{-5}N to left B) 3×10^{-5}N to the right C) 5×10^{-5}N to the right D) 5×10^{-5}N to the left	B	Two parallel wires carrying current in same direction always attract each other.
704.	The force on electron in electric field of 10^8 NC^{-1}; 2010-126 Med: (a) $1.6x10^{-4}$ (b) $1.6x10^{-8}$ (c) $1.6x10^{-10}$ (d) $1.6x10^{-11}$	D	F = qE = $1.6x10^{-19}x10^8 = 1.6x10^{-11}$
705.	An election is projected with a velocity V into a region where there exists a uniform electric field of strength E perpendicular to a uniform magnetic field of directly B. if the electron velocity to remain constant,V must be; 2015-149 Med A) of magnitude B/E and parallel to B B) of magnitude E/B and parallel to B C) of magnitude B/E and perpendicular to both $\vec{E}$ and $\vec{B}$ D) of magnitude E/B and perpendicular to both $\vec{E}$ and $\vec{B}$	D	It is velocity selector and electron will goes with constant
706.	The unit "henry" is equivalent to: 2016-66 Med **(a) Volt-second/ampere** (b) Volt/second (c) Ohm (d) Ampere volt/ second	A	
707.	The changing electric flux in a certain region of space produces: 2016-86 Med (a) An electric field **(b) Magnetic field** (c) both S// and A// (d) None of the above	B	
708.	A moving charged particle is surrounds?? 2016-127 Med (a) 1 fields (b) 3 fields **(c) 2 fields** (d) 4 fields	C	
709.	An electron enters a magnetic field acting vertically downwards with a velocity V from east. The electron is deflected along. 2016-33 Eng **(a) North** (b) South (c) East (d) West	a	

Applications of Magnetic Field,Velocity Selector,Galvanometer:

710. The current produced due to induced emf depends upon; 2010-128 Med: — C — $B = \mu_o n I \rightarrow I = \frac{B}{\mu_o n}$
(a) Area of coil
(b) Shape of coil
(c) Turns of coil
d) Strength of M. Field in which coil rotates

711. A solenoid has length *l* and *N*umber of turns. It carries a current I the magnetic field produced inside the solenoid will be: 2008-137 Med: — C — $B = \mu_0 \frac{NI}{l}$
(a) $B = \mu_0 NI\ l$ (b) $B = \mu_0 \frac{I}{Nl}$
(c) $B = \mu_0 \frac{NI}{l}$ (d) $B = \mu_0 \frac{Il}{N}$

712. For the production of electromagnetic waves the charges used are: 2010-71 Med: — C
(a) Stationary charges (b) Charges moving with uniform (c) Accelerating charges (d)All

713. In CRO the time base circuit is connected to: 2010-181 Med: — A
(a) Vertical plates (b) Electron gun
(c) Horizontal plates (d) Fluorescent screen

714. In CRO, the time bases sweep circuit is connected to the: 2009-127 Med: — A
a. X-plate b. Y-plate
c. Electron gun d. Accelerating electrode

715. The waveform of sinusoidal voltage, its frequency and phase can be found by: 2012-127 Med: — A
(a) CRO (b) Diode
(c) Transistor (d) Radio

716. A source of e.m.f. of 9.0 mV has an internal resistance of 6.0 Ω. It is connected across a galvanometer of resistance 30 Ω. What will be the current in the galvanometer? 2013-05 Eng: — B — V = Ig Rg,
(a) 250 μA (b) 300 μA
(c) 1.5 mA (d) 2.5 mA

717. Which experimental technique reduces the systematic error of the quantity being investigated? 2014-42Med: — A
(a) adjusting an ammeter to remove its zero error before measuring a current
(b) Measuring several intermodal distance on a standing wave to find the mean Internodal distance.
(c) Measuring the diameter 6f a wire repeatedly and calculating the average.
(d) Timing a large number of oscillations to find a period

CHAPTER-14: ELECTROMAGNETIC INDUCTION

ELECTROMAGNETIC INDUCTION,FARADAY,S LAW & LENZ,S LAW:

718. The phenomenon used for producing emf in coil of generator is; 2007-54 Med: — D
(a) Mutual induction (b)Self induction
(c)Electrostatic induction (d) Electromagnetic inductions

719.	The magnetic force action on a unit charge moving perpendicular to the magnetic field with unit velocity is called; 2007-144 Med: (a) Magnetic induction (b) Magnetic permeability (c) Magnetic flux (d) Permittivity	a	
720.	$\frac{volt \times second}{ampere}$ is equal to: 2011-135 Med (a) gauss (b) weber (c) henry (d) tesla	c	
721.	The SI unit of inductance is: 2010-02 Med: (a) Weber (b) Weber meter^{-2} (c)Tesia (d) Henry	d	
722.	The mechanical energy spent by the, external agency is converted into electrical energy stored in the coil. This relates to: 2015-117 Med A) Ohm's law B) Coulomb's law C) Lenz's law D) Newton's law of motion	C	Induce Emf oppose its cause ,this opposition force is converted to electrical energy & simply Lenz's Law is consistent with law of conservation of energy.
723.	The magnitude of induced e.m.f in the loop depends upon; 2011-133 Eng: (a) Change of electric flux (b) rate of change electric flux (c) rate of change of magnetic flux (d) change of magnetic flux	C	$E = -\Delta\phi\frac{\Delta\phi}{\Delta t}$'
724.	Lenz's law is a particular form of law of conservation of : 2012-87 Med: (a)Charge (b)Current (c) Energy (d) Magnetic field	C	
725.	A 100m long conductor. Carrying current of 2A is at right angle to B of 0.5 wb-m ^{2} . The force experienced by the conductor is: 2009-134 Med: (a) 1.2N (b) 3 dynes (c) Energy (d) 10^{5} dynes	C	Fm = IBL= 2x100x0.5 = 100N = 10^2x10^5 = 10^7dynes(IN = 10^{-5}dyne)
726.	The magnetic induction at a distance of 0.1m from a straight wire through which 10A current flow is: 2010-141 Eng: (a) 0.2 x 10^{-5}T (b) 2 x10^{-5} T (c) 0.02 x 10^{-5}T (d) 0.002 x 10^{-5} T	B	$B = \mu_o In = \mu_o \frac{N}{l} \times I$,
727.	The e.m.f that appears in Faradays law is; 2015-180 Eng A) Around a conducting circuit B) Around the boundary of surface used to compute magnetic field C) Throughout the surface used to compute magnetic flux D) Perpendicular to the surface used to compute magnetic flux	D	Left hand Rule
728.	You push a permanent magnet with its north pole away from you towards the loop of conducting wire in front of you. Before the north pole enters the loop the current in the loop is: 2015-15 Eng A) Clockwise B) Anti-clockwis C) Towards left D) Towards right	A	According to LenzLaw induce Emf always opposes its cause.
729.	A hydrogen atom that has lost its electron is moving east in a region where the magnetic moving east in a region where the magnetic fields directed from south to north. It will be deflected: 2016-94 Med **(a) Up** (b) Down (c) North (d) South Extra Point;	A	H^+ is a positive charge and for positive charge weuse left hand rule… Fore Fingur show Magnetic Field. Middle Fingur show Voltage direction and Thumb show deflection,So direction is up by

No.	Question	Ans	Explanation
	Note;If this question had H^- than answer would DOWN Because of Right Hand Rule. For negative charge we use Right hand Rule..		this Rule..
730.	The frequency at which 1 henry inductor have reactance of 500Ω is: 2016-108 Med **(a) 80Hz** (b) 800Hz (c) 8000Hz (d) 50Hz	A	**Hints;$X_L = 2\pi fL$** **$f=X_L/2\pi Lf$**=500Ω/2x3.14x1=500/ 6.28=79.6=**80Hz**
731.	As a loop of wire with a resistance of 10Ω moves in a constant non-uniform magnetic field, it loses kinetic energy at a uniform rate of 4.0 ms/s. The induced current in the loop is: 2016-191 Med (a) 0 (b) 2 mA (c) 2.8 mA **(d) 20 mA**	D	
732.	A rectangular loop of wire has area A. It is placed perpendicular to a uniform magnetic field B and then spin around one of its sides at frequ ency f. the maximum induced emf is: 2016-132 Eng (a) BAf (b) 1BAf (c) 2BAf **(d) 2πBAf**	D	

INDUCE EMF,SELF & MUTAUAL INDUCTION:

No.	Question	Ans	Explanation
733.	Solenoid B has twice the radius and six times the number of turns per unit length as solenoid A. The ratio of the magnetic field in the interior of B to that in the interior of A is: 2017-Eng A.2 B.4 C.6 D. 1	C	$B = \mu_0 nI \rightarrow \frac{B_b = \mu 0\ 6\ nI}{B_a = \mu 0 nI}$ $= \frac{B_b = 6}{B_a = 1}$ $= \frac{6}{1} = 6$
734.	As a loop of wire with a resistance of 10N moves in a constant non uniform magnetic field, it loses K.E. at a uniform rate of 4.0 m/s the induced current in the loop is: 2017-Eng A.0 B. 2mA C. 2.8mA D. 20Ma	d	
735.	A long solenoid has length Land total number of N turns, each of which has a cross sectional area A, it Inductance: 2015-Med A) $\mu_0 N^2 Al$ B) $\mu_0 N^2 A/l$ C) $\mu_0 N^2 l/A$ D) $\mu_0 Nl/A$	D	
736.	A flat coil of wire having 5 turns, has an inductance L. The inductance of similar coil having 20 turns is: 2015-Med A) 4L B) L/4 C) μL D) L	A	$E = \frac{\Delta}{\Delta t}(N\phi)$, Thus $E \propto N$, If N become 4 times E will also increase 4 times.
737.	The dimension of self inductance is; 2015-Eng A) MLT^2 B) $ML^2T^2A^{-2}$ C) $M^2L^{-1}T^1$ D) MT^2A^{-1}	B	
738.	When an iron core is inserted in to coil, its coefficient of self – induction; 2015-Eng A) Increases B) Decrease C) Remains the same D) Become zero	A	Iron core effect magnetic field and oppose charges.
739.	Self induction of the coil depends upon: 2010-Eng: (a) Area of coil (b) Number of turns (c) Length of coil (d) All of these factors	D	$L = \mu_o n^2 La$
740.	The motional e.m.f depends upon 2011-Med: (a) Strength of magnetic field (b) length of conductor (c) Speed of conductor (d) all of these	D	E= BVL

741. A wire loop is moved parallel to a uniform magnetic field. The induced emf in the loop will: 2008- Med:
(a) Be maximum (b) be zero
c) depend on the size of the coil (d) None of the above..
B

742. A 50 mH coil carries a current of 2 ampere. The energy stored in magnetic filed is; 2007- Med:
(a) 10 joule (b) 0.1 joule
(c)0.01 joule (d)1.0 joule
B
Energy stored in M. Field = $\frac{1}{2}$ LI^2 = $\frac{1}{2}$ (50x10^{-3}) x 2^2 = $\frac{1}{2}$ x 50 x 10^{-3}x2x2=0.1

743. The energy stored in 40 mh coil carrying 2 ampere is: 2011-Eng:
(a) 0.1 J (b) 0.8 J
(c) 0.08 J (d) 0.01 J
C
Energy stored in M. Field = $\frac{1}{2}$ LI^2 = $\frac{1}{2}$ (40x10^{-3}) x 2^2 = $\frac{1}{2}$ x 40 x 10^{-3}x2x2=0.08J

744. A long solenoid has magnetic field strength 3.14×10^{-2} T inside it when a current of 5A passes through it. The number of turns in 1m of the solenoid is: 2016-Eng
(a) 1000 (b) 3000
(c) 5000 (d) 10000
C

EDDY CURRENT,AC MOTOR,BACK EMF & TRANSFORMER:

745. In an ideal transformer connected to a 240v A.C with number of turns in primary coil are 1000 & in secondary coil are 50 turns. The output connected to the load of 10Ω. The current passes through load is: 2015-16 Eng
A) 1.2 A B) 24 A
C) 48 A D) 120 A
A
$\frac{Vs}{VP} = \frac{Ns}{Np}$, Vs=$\frac{Ns}{Np}$Vp , As Vp,Ns & Np are given So, Vs =IsR,Thus putting Vs we get; $\frac{Ns}{Np}$Vp = IsR, Now find "Is" by putting respective values; $\frac{50}{1000}$x240 = Is(10) Hence Is=**1.2 A,**

746. The efficiency of a transformer which draws a power of 20 watt is 60%, the power supplied by it is: 2015-118 Med
A) 5 W B) 1.2 W
C) 6 W D) 12 W
D
(Efficiency)η = $\frac{P^o}{Pi}$ = 60%, Thus P^o =Pi x 60% =20x60/100=12W.

747. The counter torque produced in the moving coil of generator is called: 2011-138 Med:
(a) restoring torque (b) deflection torque
(c) back motor effect (d) all of these
D

748. The phenomenon of mutual induction is induction is practically used is: 2008-19 Med:
(a)Transformer (b)Generator
(c)Galvanometer (d)Avometer
A

749. The function of a main transformer is to convert: 2013-53 Med:
(a) One direct voltage to another direct voltage of different magnitude.
(b) One alternating voltage to another alternating voltage of different magnitude.
(c) A high value alternating voltage to low value direct voltage.
(d) A high value alternating current to low value direct voltage.
B

750. In step up transformer when the alternating voltage increases then the alternating current. 2010-68 Med:
(a) Will increase (b) Will decrease
(c) Will not change (d) None of the above
B

751. An ideal transformer steps up or steps down: 2012-69 Med:
(a) Energy (b) AC voltage
(c) DC voltage (d) Power
B

No.	Question	Ans	Explanation
752.	A transformer changes 12 V to 18000 V and there are 6000 turns in the secondary coil. The number of turns in the primary coil are: 2009-160 Med: (a) 40 (b) 20 (c) 20 (d) 4	d	$\frac{Vs}{VP} = \frac{Ns}{Np} = \Rightarrow$ Np = $\frac{Ns}{Vs}$ x Vp = $\frac{6000x12}{18000}$ = Np=4
753.	The alternating current can be measured from its; 2007-Med: (a) Magnetic effect (b) Heating effect (c) Chemical effect (d) All of the above effects	D	
754.	The energy used to magnetize and demagnetize the core of transformer causes power loss which is due to; 2011- Eng: (a) Winding in coil of transformer (b) Eddy current (c) hysteresis (d) all of these	C	
755.	A generator produces 100 kW of power at a potential difference of 10KV. The power is transmitted through cables of total resistance 5Ω. How much power is dissipated in the cables? 2013-29 Med: (a) 50 W (b) 750 W (c) 500 W (d) 1000 W	C	Ii = $\frac{P}{Vi} = \frac{100\times10^3}{10\times10^3}$ = 10A P= $I^2R \rightarrow (10)^2 (5)$ 100 x 5 = 500 Watt
	A step-up transformer is one that: 2014-165: Med a) Increase the power b) Increase the current c) Increase the voltage d) Increase the energy	C	

CHAPTER-15: ALTERNATING CURRENT

SINUSOIDAL ALTERNATING VOLTAGE & CURRENT& R.M.S VALUE:

No.	Question	Ans	Explanation
756.	In the case of AC: average value of current is: 2006-Med: (a) $\sqrt{2}$ times the maximum (b) $1/\sqrt{2}$ times the maximum current (c) Zero (d) 1/2 times maximum current	C	The average is zero because in AC the current change its direction and its average is zero.
757.	9. Which statement is not valid? 2017-Eng A. Current is the speed of the charged particles that carry it. B. Electromotive force (e. m.f.) is energy converted to electrical energy from other forms per unit charge C.T he potential difference (p. d.) between two points is the work done per unit charge when moving charge from one point to the other. D. The resistance between two points is the (p. d.) between the two points per unit current.	D	V= IR R = V/I
758.	The instantaneous current in a circuit is given by $\sqrt{2}$ sin(ωt +θ) 1 ampere what is the rms value of the current? 2018-Med A) 2A B) $\sqrt{2}$ A C) 1A D) $1/\sqrt{2}$ A	C	$I_{rms} = I_{max}/\sqrt{2}$ here from equation Im = $\sqrt{2}$ so $I_{rms} = \sqrt{2}/\sqrt{2}$ = 1
759.	An alternating current in ampere varies with time to second as I = 4 sin (200πt), the frequency of current is: 2015-17 Eng A) 100 Hz B) 50 Hz C) 400 Hz D) 150 Hz	A	: $I = I_0 \sin\omega t$ & $\omega = 2\pi f$, If ω =200π Thus ; $2\pi f$ =200π Hence $f = 100Hz$.
760.	An A.C varies with time (t) sec as I=4 sin(200πt), the r.m.s value of current in "A" is: 2015-90 Eng A) 2 B) $4\sqrt{2}$ C) $\frac{4}{\sqrt{2}}$ D) $\frac{2}{\sqrt{2}}$	C	: $I = I_0 \sin\omega t$ & $I(rms) = \frac{I_o}{\sqrt{2}}$, As I_o =4 Thus $I(rms) = \frac{4}{\sqrt{2}}$
761.	Instantaneous emf at instant t is V =20 sin (100πt). The frequency of alternative current is; 2015-127 Med A) 100 Hz B) 200Hz	C	V = V_o Sin ωt & $\omega = 2\pi f$, If ω =100π Thus ; $2\pi f$ =100π

	C) 50 Hz D) 150Hz		Hence $f = 50Hz$.
762.	**4.**The sinusoidal AC current in a circuit is I = 50 sin (20 t). The peak value of current is: 2012-195 Med: (a) 100 A (b) 25 A (c) 50 A (d) 20 A	C	
763.	An alternating current is represented by the equation $I = I_0 \sin \omega t$. Which one of the following equations represent an alternating current that has half the amplitude an double the frequency? 2012-09 Eng: (a) $I = 2I_o \sin \omega t$ (b) $2I = I_o \sin \frac{1}{2} \omega t$ (c) $I = \frac{1}{2} I_o \sin 2 \omega t$ (d) $2I = I_o \sin \omega t$	C	
764.	In alternating current the average value of current in cycle is; (a) Zero (b) Constant (c) Positive (d) Maximum	A	
765.	The rms value of alternating voltage; 2010-125 Eng: (a) 1.77 volt (b) 17.7 volt (c) .707 volt (d) 0.0177 volt	C	
766.	In the case of AC: average value of current is: 2006-18 Med: (a)$\sqrt{2}$ times the maximum (b)$\frac{1}{\sqrt{2}}$times the maximum current (c) Zero (d) $\frac{1}{2}$ times maximum current	C	

A.C. THROUGH RESISTANCE,INDUCTANCE & CAPACITANCE,R.L.C CIRCUIT:

767.	The phase angle between the voltage and current in A.C througha pure inductor is: 2015-92 Eng A) 0^0 B) 90^0 C) 60^0 D) 180^0	B	
768.	An Alternating current of r.m.s 20mA passes through a 4KΩ resistor. What is the average power dissipated? 2012-73 Eng: (a) 0.8w (b) 1.6w (c) 8×10^8w (d) 1.6×10^8w	B	$P = (I_{r.m.s})^2 R = (20 \times 10^{-3})^2 \times 4 \times 10^3 = (2 \times 10^{-2})^2 \times 4 \times 10^3 = 4 \times 4 \times 10^{-4} \times 10^3 = 16 \times 10^{-1} =$ 1.6Watt
769.	In simple A.C capacitive circuit: 2010- Eng:, 2008-Med: (a)the voltage leads the current by 90^0 (b) the voltage legs behind the current by 90^0 (c) The current leads the voltage by 90^0 (d) the current and voltage are in phase.	C	
770.	The capacitive reactance of the AC circuit increases: 2011-20-Med (a) By increasing the frequency of AC (b) By decreasing the frequency of AC (c) Does not depend upon the frequency of AC voltage (d) None of these	B	$X_c = \frac{1}{\omega c} = \frac{1}{2\pi f C} \Rightarrow X_c \propto \frac{1}{f}$
771.	In power loss in a capacitor in A.C circuit is: 2009-163Med (a)$< P >= V_0 I_0$ (b)$< P >= V_0 I_0 \sin \omega l$	D	

(c) $< P >= V_0 I_0 Cos\omega l$ (d) $< P >= Zero$

---

772. In an AC capacitive circuit, current and voltage phase relation is: — **B**
(a) In-phase
(b) Current leads voltage by 90^o
(c) Voltage leads voltage by 90^o
(d) Current leads voltage by 180^o

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773. The resonance frequency of an LCR circuit is: 2015-91 Eng — **D**
A) $\frac{1}{2\pi Lc}$ B) $2\pi\sqrt{Lc}$
C) $\frac{1}{Lc}$ D) $\frac{1}{2\pi\sqrt{Lc}}$

---

774. In RLC series circuit when the frequency of AC source is very high then such circuit will be; 2011-143 Eng: — **D**
(a) Resistive circuit (b) capacitive circuit
(c) Resonance circuit (d) Inductive circuit

$X_L = \omega L = 2\pi f L \Rightarrow (X_L \propto f)$,

---

775. In RLC series circuit when the frequency of AC source is very low, the circuit is a / an; 2011-145 Med: — **B**
(a) resistive circuit (b) capacitive circuit
(c) inductive circuit (d) resonant circuit

$X_c \propto \frac{1}{f}$

---

776. A.C and D.C have the same: 2016-58 Med — **C**
(a) Affect in charging battery
(b) Affect in charging capacitor
(c) Heating effect through a resistance
(d) Affect passing through an inductance

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777. 11.In a purely resistive circuit the current: 2016-41 Med — **D**
(a) Leads the voltage by one-half of a cycle
(b) Leads the voltage by one-fourth of a cycle
(c) Leads the voltage by one-half of a cycle
(d) Is in phase with the voltage

---

778. In pure inductance, the average power dissipated is: 2016-190 Med — **D**
(a) 1 (b) Greater than 1
(c) Less than 1 **(d) Zero**

No power loss in pure inductive or capacitive circuit takes place

MAXEWELL EQUATIONS,ELECTROMAGNETIC WAVES:

779. In house circuit all the electric appliances are connected in parallel between main line and neutral line appliances will have; 2010-85 Med: — **D**
(a) Same current
(b) Same power
(c) Different potential and same current
(d) Same potential difference

---

780. Which arrangement of the Photon is in their decreasing energy? 2012-28 Med: — **B**
(a) x rays >i.r. >u.v. > visible
(b) x rays >u.v. > visible >i.r.
(c) u.v. > x rays > visible>i.r.
(d) i.r. > visible > x rays>u.v.

---

781. Which of the following has least wave length? 2009-01;Med — **B**
(a) ∝-rays (b) x-rays
(c) cosmic rays (d) β-rays

---

782. Which of the following has the high energy photon? 2007-62 Med: — **D**
(a) Visible light (b) X-rays

(c) Ultraviolet light (d)γ-rays

---

783. The radio waves of contant amplitude are called 2007-112Med — **B**

(a) Modulated waves (b) Carrier waves
(c) Standing waves (d) Rectified waves

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784. The process of superposing the sound waves on carrier waves is called: 2010-159 Eng: — **B**

(a) Rectification (b)Modulation
(c) Amplification (d) Transformation

---

785. The carrier waves on which the low frequency sound waves are super imposed are called — **C**

(a) micro waves (b) short waves
(c) modulated waves (d) medium waves

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786. The process of combining low frequency signal with high frequency carrier waves is called; 2011-148 Med: — **B**

(a) Rectification (b) Amplification
(c) Modulation (d) Magnification

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787. For the production of electromagnetic waves the charges used are: 2010-71 Eng: — **C**

(a) Stationary charges (b) Charges moving with uniform
(c) Accelerating charges (d)All of the above

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788. Which of the following rays are not electromagnetic radiations? 2015-135 Eng — **C**

A) X-rays B) UV rays
C) Cathode rays D) Infrared rays

Cathode rays are electrons and are particals.

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789. Which of the following electromagnetic waves has the smallest wavelength? 2016-158 Med — **C**

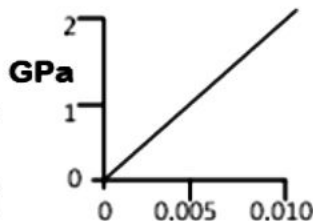
(a) X-rays (b) Gamma rays
(c) Microwaves (d) Ultraviolet rays

CHAPTER-16: PHYSICS OF SOLIDS

Classification Of Solids,Elastic & Young Modulus,Hook,s Law:

790. The stress-strain graph for a metal is shown. — **D**

What is the strain energy per unit volum e of a rod made from this metal when the strain of the rod is 0.0107. 2018-Med

(a) 10 kJ m^{-3} (b) 100 kJ m^{-3}
(c) 1.0 MJ m^{-2} (d) 10 MJ m^{-3}

Strain energy per unit volume = 1/2 (stress x strain)
= 1/2 (2 x 10^{9} x 0.01)
$=10^{+9} \times 10^{-2}$
$=10^{7}$ J/m^{-3}
= 10 MJ/m^{3}

---

791. To determine Young's modulus of a material of a given wire of length L we use: 2018-Med — **C**

A)Melde's Apparatus
B)Young's Apparatus
C)Searle's Apparatus
D)Cavendish Apparatus

No.	Question	Ans	Explanation
792.	The young's modulus of a given rod of uniform length L is given by the relation: 2018-Med A)FL/A B)FA/L C)FL/πr^2l D)Fl/πr^2 L	C	Y = F/A / Δl/L = F L/ AΔl = FL/ πr^2 l
793.	What is represented by the gradient of a graph of force F (vertical axis) against extension x (horizontal axis)? 2018-Eng A) Elastic limit B)Spring constant C)Stress D) Young modulus	B	F = kx → k = F/x
794.	A spring obeying Hooke's law has an upstretched length of 50 mm and a spring constant of 400 Nm. What is the tension in the spring when its overall length is 70mm? 2018-Eng A)8.0 N B)28 N C160 N D)400 N.		
795.	The shear modulus of elasticity G is 2015-138 Med A) $\frac{Al}{F\theta}$ B) $\frac{Fl}{A\theta}$ C) $\frac{F}{A\theta}$ D) $\frac{A\theta}{F}$	C	
796.	Hook's law correlates the: 2012-119 Med: (a) Force and displacement (b)Force and extension (c) Force and compression (d)Stress and strain	D	stress/strain = elastic Modulus (Hook's law)
797.	The reciprocal of bulk modulus is called: 2010-167 Eng: (a) Plasticity (b) Conductivity (c) Compressibility (d) Ductility :	C	
798.	Which of the following is the most elastic one? 2012-113 Eng: (a) Rubber (b) Wood (c) Sponge (d) Steel	D	
799.	The solids in which the molecules or ions are arranged in a regular repetitive manner are called: (a) Amorphous solids (b) Glassy solids (c) Polymers (d) Crystals	D	
800.	In which of the following pairs are both substances normally crystalline? 2013-36 Med: (a) Copper and diamond (b) Copper and glass (c) Copper and rubber (d) Diamond and glass	A	
801.	Choose the region of the spectrum which would be used to determine the structure of crystalline solids: 2011-156 Med: (a) Visible (b) Infrared (c) X– rays (d) Ultraviolet	C	
802.	Sodium chloride crystal structure is: 2014-161 Med: a) Hexagonal b) Body centered cubic c) Face centered cubic d) Tetragonal	C	
803.	Select the true statement about the amorphous solids: 2014-64: Med a) The amorphous substances have sharp melting point b) The amorphous substances do not have fixed melting point c) The amorphous substances have proper geometrical shapes. d) The particles in amorphous substances are arranged in an orderly manner.	B	

804. Stiff material is characterized by; 2015-197 Eng — C
A) High ultimate strength B) High proportional limit
C) High young modulus D) High breaking length

805. Two wires have the same diameter and length. one is opposite direction then the two wires must have the same. Made of copper the other is brass. The wire s are connected to gather end to end when the free end are pulled in; 2015-198 Eng — A
A) Stress B) Strain
C) Elongation D) Young's modulus

806. What is the ultimate tensile stress of a material? 2012-123 Eng: — C
(a) the stress at which the material becomes ductile
(b) the stress at which the material deforms plastically
(c) the stress at which the material reaches its elastic limit
(d) the stress at which the material breaks

807. The ratio of volumetric strain to volumetric stress is called: 2011-152 Med: — A
(a) Compressibility (b) young's modulus
(c) bulk's modulus (d) shear's modulus

Mechanical Properties of Solid;

808. What behaviour is the copper exhibiting? 2017-Eng — b
A.Brittle Only
B.Elastic Only
C.Plastic Only
D.Both (A) & (B)

809. The applied force at which solids can be determined? 2011-149 Eng: — A
(a) Strength (b) ductlily
(c) stiffness (d) toughness

810. The substances which undergo deformation with small force are called; 2010-186 Med: — A
(a) Elastic substances (b)Inelastic substances
(c) Diamagnetic substances (d)Ductile substances

811. The applied force which the solid can withstand without breaking is calle 2007-74 Med: — B
(a) Stiffness of solid (b) Strength of solid
(c) Ductility of solid (d) Toughness of solid

812. The substance which breaks just the elastic limit is reached is: 2011-153 Eng: — D
(a) plastic substance (b) ductile substance
(c) ordinary substance (d) brittle substance

813. The substance which undergoes plastic deformation until it breaks is: 2011-155 Med: — A
(a) ductile substance (b) brittle substance
(c) plastic substance (d) all of these

Energy Band Theory,Insulator,Conductor Semiconductor & Superconductor;

814. According to the band theory of solids in the conductors, the conduction band and valance band are: — B
A) Separated by large space B) Overlapped
C) Separated by forbidden energy gap D) None of the above

815. Semi-conductor material have ; 2015-129 Med — B
A) Ionic bond B) Covalent bond
C) Mutual bond D) Metallic bond

816.	Metals are good conductors of electricity because they contain:2010-130 Med: (a) Large number of freely mobile electrons (b) Large number of bound electrons (c) Small number of free electrons (d) Small number of bound electrons	A	
817.	The resistance of the pure semi conductor decreases in a certain range with the: 2009-33 Med (a)Decrease of temperature (b) Increase in current (c) Increase of temperature (d) Decrease in current	C	
818.	The increase in temp of intrinsic semiconductor will; 2007-44 Med: (a) Increase its conductivity (b) Decrease its conductivity (c) Not effect conductivity (d)None of these	A	
819.	Current in the semiconductors is caused by the movement of: 2012-198 Med A) Protons B) Electrons only C) Holes only D) Both electrons and holes	D	

Paramagnetic,Diamagnetic & Ferromagnetic,Magnetic Hysteresis:

820.	When a permanent magnet is strongly heated? 2015-10 Eng A) It becomes an induced magnet B) It loses its magnetism C) Its magnetism increases D) Its polarity reverses	B	
821.	The temperature at which the resistance of conductor approaches to zero is called; 2011-156 Eng: (a) Curie temperature (b) Critical temperature (c) Absolute temperature (d) Normal temperature	B	
822.	A p-type crystal is formed when Ge or Si crystal is doped with an impurity which is: 2008-119 Med; (a)Nonviolent (b)Divalent (c) Trivalent (d)Pentavalent	C	
823.	If diamagnetic substance is brought near north or south pole of a bar magnet, it is; 2009-175 Med: (a) Attracted by the poles (b) Attracted by North pole and repelled by south pole (c) Attracted by South Pole and repelled by North Pole (d) Repelled by the poles	D	
824.	The temperature at which the domains of the ferromagnetic substances disorient is; 2011-158 Med: (a) Critical temperature (b) absolute temperature (c) Curie Temperature (d) normal temperature	C	
825.	Which of the following is not ferromagnetic substance: 2014-50 Med: a) Iron b) Cobalt c) Nickel d) Barium	D	
826.	The behavior of ferromagnetic domains in an applied magnetic field gives rise to ; 2015-137 Med A) Hysteresis B) Ferromagnetism C) The Curie law D) Gauss's law for magnetism	A	In applied magnetic field the flux density of material 'B' lags behind the applied magnetizing force 'H' called Hysteresis

CHAPTER-17: ELECTRONICS

Intrinsic Semiconductors& Carriers,N & P-Type Semiconductors,PN Junction:

No.	Question	Ans	Explanation
827.	In N type semi-conductor, conduction is due to mainly by: 2015-25 Eng A) Hole B) Protons C) Electrons D) Neutrons	C	As in N-type semi-conductor is doped with pentavalent so there are free electrons.
828.	Current in the semiconductors is caused by the movement of: 2012-198 Med: (a) Protons (b) Electrons only (c) Holes only (d) Both electrons and holes	D	In semiconductor, electron flow occurs due to electrons and as well as holes
829.	The depletion region contains: 2011-, 2010- Eng: (a) electrons (b) holes (c) electrons and holes (d) No holes and no electrons	D	In depletion region electrons and holes are combined.
830.	In an unbiased PN junction; 2015-14-Med A) The electric potential vanishes every where B) The electric field vanishes every where C) The diffusion current vanishes every where D) The diffusion and drift currents cancel each other	D	
831.	In P type substances, the charge carriers in minorities are: 2015-139 Med A) Holes B) Electrons C) Protons D) Positive ions	B	
832.	The process by which the potential barrier of the depletion region can be increased or decreased is called: 2011-1620Med: (a) Amplification (b) Biasing (c) Modulation (d) Doping	B	
833.	Intrinsic semi-conductor can be converted into extrinsic semi-conductor by adding: 2016-170 Med (a) Trivalent impurity (b) Pentavalent impurity **(c) Pentavalent or trivalent impurities** (d) None of the above	C	

Rectification,Transistor

No.	Question	Ans	Explanation
834.	The diode is used as:2017-Eng A.A modulator B.An amplifier C.A rectifier D. an oscillator	c	Ac to DC conversion is called rectification and the instrument is called rectifier, Diode is used as rectifier.
835.	Conversion of alternating current into direct current is called: 2012-179 Med: (a) Rectification (b) Amplification (c) Oscillation (d)Regeneration	A	Ac to DC conversion is called rectification and the instrument is called rectifier, Diode is used as rectifier.
836.	Transistor in a circuit basically acts as: 2008-151 Med (a)Voltage amplifier (b)oscillator (c) current amplifier (d) rectifier	C	
837.	In transistor the emitter to base function is: 2010-12 Med: (a) Reversed biased (b)Forward biased (c) Neutral (d) None of these	B	Emitter to base is forward while base to collector is backward bias.
838.	The current gain of transistor having collector current of 10mA and the base current of 40*u* A is; 2007-181 Med: (a) 2.5 (b) 25 (c) 250 (d) 2500	C	current Gain $\beta = \frac{Ic}{IB} = \frac{10\times10^{-3}A}{40\times10^{-6}A} =$ 250,
839.	The ratio of output voltage V_0 to the voltage difference V_{in} between the positive (+) input and negative (-) input of opamp is (where $V_{in}=V_+ - V_-$:) 2012-12 Med: (a) Current gain (b) Voltage gain	C	

(c) Open-loop gain (d) Close-Loop gain

840. Conversion of alternating current to direct current is called: 2014-44: Med
a) Amplification b) Rectification
c) Modulation d) Both B & C
B
Ac to DC conversion is called rectification and the instrument is called rectifier, Diode is used as rectifier.

841. The circuit which is built of silicon chip, and ….. of transistor and capacitor is called: 2011-163 Eng:
(a) Rectifier circuit (b) Amplifier circuit
(c) Operational amplifier (d) Close circuit
B

842. For a non inverting amplifier the gain is given by: 2012-23 Eng:
A
(a) $G = 1 + \frac{R_2}{R_1}$ (b) $G = \frac{1+R_1}{R_2}$

(c) $G = -\frac{R_1}{R_2}$ (d) $G = -\left(\frac{R_1}{R_2} + 1\right)$

Photo Diode,LED,Solar Cell

843. The resistance of light dependant resistance LDR: 2012-Med:
(a) Increases with light (b) Decreases with light
(c) Decreases with darkness (d) None of the above
B

844. The diode that converts electrical energy into light energy is called: 2012-24 Med:
(a) Solar cell (b) Photodiode
(c) Vacuum diode (d) Light emitting diode
D

845. The color of light emitted by light emitting diode depends upon: 2011-165 Med:
(a) Forward voltage (b) reverse current
(c) Forward current (d) type of semiconductor
D

CHAPTER-18:DAWN OF MODERN PHYSICS

Reference Frames;

846. The proper time between two events, is measured by click at rest in a reference frame in which the two events; 2015-159 Med
A) Occurs at the same time
B) Occurs at the same co-ordinates
C) Are separated by distance, a light signal can travel during time interval
D) Satisfy none of above
B

847. According to the postulates of the theory of Relativity, a fourth dimension has been added to the three dimensions already associated with a Cartesian frame of reference. Which is the fourth dimension? 2005-17 Med:
(a) Space (b) Inertial frame of reference
(c) Speed of light (d) Time
D

848. A meter rod is moving with speed of light with respect to a stationary observer. The length of the rod will appear to the observer as approaching: 2008-160 med:
(a)Infinite (b) Zero m
(c) 2 meter (d)None of the above
B
$\ell = \ell_o\sqrt{1 - \frac{v^2}{c^2}}$ when V = C than ℓ = o

849. If a material particles starts motion with speed equal to the speed of light, then the mass of this moving particle will; 2007-95 Med:
(a) Remain constant (b) Become zero
(c)Decome equal to rest mass of particle (d) Become infinite

D — $\left(m = \frac{mo}{\sqrt{1-\frac{v^2}{c^2}}}\right)$ If v = c than m= ∞ (infinite)

---

850. A clock is moving with the relativistic velocity with respect to an observer, this clock with respect to the observer will: 2011-169 Eng:
(a) Run fast (b) run slow
(c) run normally (d) stop

B

---

851. To an observer stationary on a plate form compared to a stationary clock and a moving clock clicks: 2008-60 Med:
(a) Slower (b) Faster
(c) Same rate as stationary clock (d)Clicks negative time

a

---

852. A charge moving at a relativistic speed has a speed; 2010-35 Med:
(a) Equal to speed of light (b) Greater than speed of light
(d)None of these (d) both a and b

C

---

853. Which one of the following is a correct relation? 2008-78 Med:

(a) $m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}$ (b) $m = \frac{m_0}{\sqrt{1-\frac{v}{c}}}$

(c) $m = m_0\left(1-\frac{V^2}{C^2}\right)$ (d) $m = \frac{m_0}{\sqrt{1-\frac{C^2}{V^2}}}$

A

---

854. Einstein's universe what is the fourth dimension: 2016-57 Med
(a) Distance (b) Speed
(c) Time (d) Energy

C

---

855. The proper time between two events is measured by clocks at rest in a reference frame in which the two events: 2016-142 Eng
(a) Occur at the same time
(b) Occur at the same coordinates
(c) Are separated by distance a light signal can travel during the time interval
(d) Occur in Boston

b

Black Body Radiation,Photoelectric Effect

856. The maximum energy of the electrons released in photocell is independent of: 2018-Med
A)Frequency of incident light
B)Intensity of incident light
C)Nature of cathode surface
D)Wavelength of light

B — The maximum energy of the electrons released in photocell is independent of intensity and it dpends upon the frequency

---

857. The maximum kinetic energy of photoelectrons emitted depends upon: 2018-Eng
A)Intensity of incident light.
B)Frequency of incident light
C) Temperature of the
d) non of the above

B — The maximum kinetic energy of photoelectrons emitted depends upon frequency of the light, and independent of intensity

---

858. As the temperature of black body is increased the wavelength of maximum intensity radiation: 2007-77 Med:
a. will shift towards the longer wavelength

B — E = hf
E = hc//λ
As temperature increase, the energy

Q	Question	Ans	Explanation
	b. will shift towards the shorter wavelength c. will not changed d. none of these		increase and wavelength decrease.
859.	If the temperature of the black body becomes double the intensity of radiation from it will become: 2011-172 Med: (a) double (b) four times (c) six times d) sixteen times	D	$E \propto T^4$
860.	The reverse process of photoelectric effect is. 2007-130 Med: (a) X-rays (b) Annihilation of matter (c) Materialization of energy (d) Pair production	A	
861.	If frequency of incident light falling on photo-emissive plate is doubled. Kinetic energy of emitted photoelectron is: 2009-74, 2006-24 Med: (a) Doubled (b)More than double (c) Unchanged (d) Less than double	A	K.E $\propto$ f
862.	The maximum KE of emitted photoelectrons depends on: 2012-20 Med, 2012-103 Eng: (a)Intensity of the incident light (b)Frequency of the incident light (c)Temperature of the photosensitive surface (d) None of the above	B	
863.	The number of photoelectrons emitted per second from the metal surface depends upon: 2007-186, 2006-156 Med: (a) Intensity of light (b) Frequency of light (c) Wavelength of light (d) speed of light	A	Intensity of light is directly proportional to the numbers of electrons emitted from the metal surface.
864.	The scientist who was awarded noble prize for explaining photoelectric effect; 2010-177 Med: (a) Max plank (b) Compton (c)Louise (d) Einstein	D	Einstein explained photoelectric effect.
865.	The minimum frequency of incident light required to emit photoelectrons from the metal surface is called: 2014-83 Med: a) Critical frequency b) Intermediate frequency c) Work function d) Threshold frequency	D	Threshold frequency is the minimum frequency required to emit an electron from metal surface.
866.	The number of ejected photoelectrons increases with increase. 2016-51 Med **(a) In intensity of flight** (b) In wavelength of light (c) In frequency of light (d) Never	a	
867.	In a photoelectric effect experiment the stopping potential is: 2016-143 Eng (a) The energy required to remove an electron from the sample (b) The kinetic energy of the most energetic electron ejected (c) The potential energy of the most energetic electron ejected **(d) The electric potential that causes the electron current to vanish**	d	

Compton,s Effect,Pair Production,Pair Annihilation:

Q	Question	Ans	Explanation
868.	The scattering angle for which the Compton shift in wavelength is equal to Compton wavelength is: 2011-175 Med: (a) $\theta = 90^o$ (b) $\theta = 0^o$ (c) $\theta = 45^o$ (d) $\theta = 180^o$	A	

No.	Question	Ans	Explanation
869.	In Compton effect, the photon scattered at an angle of 90^0. The Compton's shift of wavelength will be; 2008-189 Med: (a) $\Delta\lambda = \frac{h}{m_0 C}$ (b) $\Delta\lambda = \frac{h}{m_0 C^2}$ (c) $\Delta\lambda = \frac{m_o C}{h}$ (d) $\Delta\lambda = \frac{m_0 C^2}{h}$	A	
870.	Pair production can take place only if the energy E of the phorton is: 2008-142 Med: (a) E =0.52 Mev (b) E <1.02Mev (c) E<0.52Mev (d) E > 1.02Mev	D	
871.	4.In Compton scattering from stationary electrons the largest change in wavelength occurs when the photon is scattered through: 2016-23 Med (a) 0^0 (b) 45^0 (c) 90^0 **(d) 180^0**	d	$\Delta\lambda = \frac{h}{m_0 C}$ **(1-cos180^0) As cos180^0=-1 So,** $\Delta\lambda = \frac{h}{m_0 C}$ **{1-(-1)} =** $\frac{2h}{m_0 C}$

Wave Nature of Particle,Wave Particle Duality & Uncertainity Principle;

No.	Question	Ans	Explanation
872.	Work function for a certain surface is 3.26 eV .Minimum frequency, light must have in order to eject electron from surface will be; 2017-64 Med A. 1.6 x 10^{15} Hz B. 3.2 x 10^{15} Hz C. 4.8x 10^{15} Hz D. 6.4 x 10^{15}Hz	D	
873.	The uncertainty in position of an electron in a certain state is 5 x 10^{-10} m, the uncertainty in its momentum might be: 2017-Eng A.5.0 x 10^{-24} kg.m/s B.4.0 x 10^{-24} kg.m/s C.3.0x 10^{-24} kg.m/s D.1.5x 10^{-24} kg.m/s	D	ΔP Δx=h →ΔP=h/Δx = 6.6262 x 10^{-34} /5 x 10^{-10} =1.5 x 10^{-24} kg.m/s
874.	A photon of frequency f has a momentum associated with it if C is the velocity of light this momentum is: 2017-Eng A. hf B. 2hf C. hf/c D. hf/c^2	C	
875.	22 The rest mass of Photon is m_0 . Its linear momentum, when it moves with the speed equal to half of the speed of light in space, will be; 2018-Med A)3m_0 c/4 B)2m_0 c/ 4 C) m_0 c/ $\sqrt{3}$ D)2 m_0 c/ $\sqrt{3}$	C	
876.	The rays with a particle nature is of; 2018- Eng A) γ-rays B)X-rays C) Cathode rays D)Cosmic rays	C	Cathode rays are not rays these are actually electrons.
877.	Work function for a certain surface is 13.26eV, minimum frequency, light must have in order to eject electron from surface will be: 2018-Eng A)1.6 x 10^{15} Hz B)3.2 x 10^{15} Hz C)4.8x 10^{15} Hz D)6.4 x 10^{15}	B	
878.	If I ng of mass converts into energy, how many joules of heat will be generated? 2018-Eng A)3 x 10^{-3} J B)1 x 10^3 J C)9 x 10^{-3} J D)9 x 10^4 J	D	E = mc^2 =10^{-12} x (3 x 10^8)^2 = 9 x 10^4 J

879. A photon is: 2018-Eng
A) A charged particle
B) An electron-positron pair
C) A packet of energy
D) Neutron
C A photon is packet of energy because it move with a speed of light.

---

880. Choose the correct relationship, when E=energy, h=plank's constant, c=velocity of light, ν = frequency,λ=wavelength: 2015-34 Med
A) E = hνc B) $E = \frac{c}{\lambda}$
C) E = hf D) $E = \frac{n\lambda}{c}$
C

---

881. Which of the following is the best evidence for the wave nature of matter? 2015-17 Med
A) The photoelectric effect
B) The Compton effect
C) The spectral radiation form cavity radiation
D) The reflection of electrons by crystal
D Reflection is purely wave phenomenon

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882. A photon is: 2012-19 Eng:
(a)a charged particle
(b) an electron-positron pair
(c)a quantum of electromagnetic radiation
(d) neutron
C

---

883. The threshold frequency for a metal having work function 6.4 eV is:
(a) $6.4\times10^{-19}Hz$ (b) $6.4\times10^{-34}Hz$
(c) $1.5\times10^{15}Hz$ (d) $1.5\times10^{-15}Hz$
C $\phi = hf_o \Rightarrow f_o = \frac{\phi}{h} = \frac{6.4ev}{6.6262\times10^{-34}} = \frac{6.4x1.6x10^{-19}}{6.62\times10^{-34}} = \frac{10.24\times10^{-19}J}{6.62\times10^{-34}} =$ $1.5x10^{15}$Hz

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884. What energy in joules would a photon of light have at wave length 3×10^{-3} cm? $(h=6.6\times10^{-34})$ 2011-168 Eng:
(a) 2.2×10^{-31} (b) 2.64×10^{-36}
(c) 6.6×10^{-47} (d) 6.6×10^{-21}
D $E = hf = = \frac{hc}{\lambda} = = \frac{6.6\times10^{-34}\times3\times10^{8}}{3\times10^{-5}m}$ E $= 6.6 \times 10^{-21}$ J,

---

885. Energy of a photon having frequency 10 Hz will be:
(a) $6.63\times10^{-19}J$ (b) $6.63ev$
(c) $6.63\times10^{-21}J$ (d) $4.125x10^{-14ev}$
D $E=hf = 6.6x\ 10^{-34}\ x10 = 6.6 \times 10^{-33}$ $J=\frac{6.6\times10^{-33}}{1.6x10^{-19}} = 4.125x10^{-14}$ev,

---

886. The kinetic energy of electron proton alpha particles and neutron is the same. Which one will have the shortest wavelength; 2011-176 Eng:
(a) electrons (b) protons
(c) alpha particles (d) neutrons
C $\lambda = = \frac{h}{mv} \rightarrow (\lambda \propto \frac{1}{m})$

---

887. If your body mass is 66.26 kg and you are running at the speed of10ms^{-1} what will be the De Broglie wave length associated with you?(h = 6.626×10^{-34}js); 2012-12 Eng:
(a)10.0×10^{-36}m (b)10.0×10^{34}m
(c)5.0×10^{34}m (d)2.0×10^{33}m
A $\lambda = = \frac{h}{mv} = \frac{6.63\times10^{-34}}{66.26x10} = 0.0100x10^{-34} = 10x10^{-36}$m

---

888. Uncertainly principle can be expressed as: 2008-36 Med:
(a) $\Delta p \Delta \chi = h$ (b) $\Delta E \Delta I = h$
(c) Both (a) and (b) (d) non of these
C

---

889. Which of the following particle can move with the speed of light? 2010-116 Eng:
(a) Electron (b) Positron
(c) Proton (d) Photon
D

---

890. What energy (in joules) would a photon of light with a wave length 3×10^{-4} cm (h=6.6×10^{-34}Jsec) have; 2013-140
C $E = hf = \frac{hc}{\lambda} = 6.62 \times 10^{-34} \times 3 \times$

	Eng: (a) 2.2×10^{-44} (c) 3.3×10^{-21} (c) 6.6×10^{-20} (d) 6.6×10^{-48}		$\frac{10^8}{3\times10^{-6}}$ = 6.62 x 10^{-20}
891.	The de-Broglie wavelength of a rifle bullet of mass 0.02kg which is moving at a speed of 300 ms^{-1} is (where h= 6.63 x 10^{-34}J s):2014-179 Med,2013-12 Eng: (a) 7.3×10^{-34} m (b) 1.1×10^{-34} m (c) 1.8×10^{-34} m (d) 9.9×10^{-34} m	B	$\lambda = \frac{h}{mv} = = \frac{6.63\times10^{-34}}{0.02\times300}$ = 1.1 x 10^{-34}m
892.	The uncertainty energy of photon which is emitted from an atom, radiating for 10^{-8} seconds is; 2011-178 Med: (a) $4x10^{-7}$J (b) $4x10^{-7}$ev (c) $6.6x10^{-20}$ev (d) 4x10J	B	E x t = h $E = \frac{h}{t} = \frac{6.6262\times10^{-34}}{10^{-8}}$ = $6.62x10^{-26}$J = $\frac{6.62\times10^{-26}}{1.6\times=10^{-10}}$ =4x 101^{-7}ev
893.	14. Select the correct relation between wave and particle nature of radiation? 2014-112 Med: a) $E = \frac{hc}{\lambda}$ b) $E = \frac{h\lambda}{c}$ c) $E = \frac{\lambda c}{h}$ d) $E = h\lambda c$	A	E=hf where $f = \frac{c}{\lambda}$ so $E = \frac{hc}{\lambda}$
894.	The de-Broglie wavelength of a rifle bullet of mass 0.02kg which is moving at a speed of $300ms^{-1}$ is (where h = 6.63×10^{-34} Js) 2014-179 Med: (a) 7.3×10^{-34} m (b) 1.1×10^{34} m (c) 1.8×10^{-35} m (d) 9.9×10^{-34} m	B	$\lambda = \frac{h}{mv} = = \frac{6.63\times10^{-34}}{0.02\times300}$ = 1.1 x 10^{-34}m
895.	Work function for a certain surface is 3.26 eV. Minimum frequency, light must have in order to eject electron from surface will be: 2016-52 Eng (a) 1.6×10^{14} Hz (b) 3.2×10^{14} Hz **(c) 7.8×10^{14} Hz** (d) 6.4×10^{14} Hz	C	ϕ = hfo ⇒fo = $\frac{\phi}{h} = \frac{3.26ev}{6.6262\times10^{-34}}$ = $\frac{3.26x1.6x10^{-19}}{6.62\times10^{-34}}$ =0.78 x10^{15}=**7.8 × 10^{14} Hz**
896.	The uncertainty in position of an election in a certain state is 5 × 10^{-10}m. The uncertainty in its momentum might be 2016-192 Eng (a)5.0×10^{-24}kg .m/s (b) 4.0×10^{-24}kg . m/s **(c) 3.0×10^{-24}kg .m/s** (d) All of the above	C	
897.	Which of the following properties of an electron is made use of in the electron Microscope? 2016-43 Eng (a) High velocity **(b) Wave nature** (c) Interference (d) Diffraction	B	

CHAPTER-19: ATOMIC SPECTRA

Atomic Spectra,Bohr Model of Hydrogen;

898.	When a hydrogen atom makes the transition from the second excited state to the ground state (at - 13.6 ev), the energy of the photon emitted is: 2017-Eng A.1.5ev B.9.1eV C. 12.1eV D.10.2eV	C	E = E2-E1 $= \frac{-13.6 eV}{3^2}) - \frac{-13.6 eV}{1^2}$ $=\frac{-13.6 eV}{3^2}) + \frac{13.6 eV}{1^2}$ = 12.1 eV
899.	The ionization potential of a hydrogen atom is 13.6eV what will be the energy of the electron in the second orbit? 2018-Med a)-10.2 eV b)-3.40 eV c)+3.40 eV d)-1.51 eV	B	$E_2 = -13.2/2^2$ = -13.2/4 = -3.40eV
900.	Which of the following series lie in the visible region?2018-Med A)Lyman B)Paschen C)Balmer D)Pfund	C	Lyman→Ultraviolet Balmer→Visible Paschen→Near IR Bracket→Mid IR Pfund→Far IR

No.	Question	Ans	Explanation
901.	If 13.6eV energy is required to ionize the hydrogen atom, then the required energy to remove an electron from n 2 is; 2018-Eng A)10.2Ev B)0eV C)3.4eV D)6.8Ev	C	$E_2 = -13.2/2^2$ = -13.2/4 = -3.40eV = +3.40 eV Positive sign is for giving energy
902.	What is the magnitude of the linear momentum of a particle if its de Broglie's wavelength is 0.02 nm? 2018-Eng A)0.5 h B)50 h C)$5x10^7$ h D)$5x10^{10}$ h	D	
903.	In the main postulates of Bohr atomic theory the angular momentum of electron in hydrogen atom is given by the relationship. 2015-56 Med A) $mv = \frac{\lambda}{2\pi}$ B) $r = \frac{Ze^2}{4\pi E_0 mv}$ C) mvr = $\frac{nh}{2\pi}$ D) hvc	C	
904.	For a H-atom which one of the following statements is correct? 2008-170 Med: (a)the radius of the orbits are integral multiple of the Bohr-radius …. 0.053mm (b)The angular momentum is n times $\frac{h}{2\pi}$ (c)the energy in the nth- orbit is n times the ground state energy. (d) None of the above	B	
905.	Who postulated the following equatioin for energy emission when an electron drops from state n_2 to n_1? 2010-118 Eng: (a) Einstein (b) Bohr (c) Rutherford (d) Heisenberg	B	
906.	When atoms in the gaseous state are excited to emit radiations, the spectrum obtained is: 2013-108 Eng: (a) Band spectrum (b) Line spectrum (c) Continuous spectrum (d) None of the above	B	The atomic spectrum is line spectrum.
907.	An electron in a hydrogen atom makes a transition from an energy level with energy El, to one with energy E2 and simultaneously emits a photon. The wavelength of the emitted photon; 2013-92 Eng: (a) h/E_1, E_2) (b) hc/E_1- E_2) (c) h/c ($E_1 - E_2$) (d) ($E_1 - E_2$)/hc	B	
908.	When an electron drop from any higher orbit i.e. $n_2 \geq 3$ to the second orbit n_1 = 2, the spectral lines produced fall in the region: 2015-194 Med A) Visible B) Ultraviole C) Infrared D) None of the above	A	
909.	Hydrogen atom in their ground state absorbs energy from the incident photon. Which makes a transition to energy level characterized by n = 4 the number of lines observed are: 2009-81 Med: (a) 8 (b) 4 (c) 6 (d) 10	C	number of spectral lines = $\frac{n(n-1)}{2}$ = $\frac{4(4-1)}{2} = \frac{4(3)}{2} = \frac{12}{2}$ = 6,
910.	If an atom exists in the excited state n = 5, the maximum number of transition takes place is: 2011-182 Med: (a) 6 (b) 5 (c) 10 (d) 3	C	

911. The shortest wavelength of radiation in Paschen series is: 2012-107 Med:
(a) $R_H/9$ (b) $9/R_H$
(c) $9\ R_H$ (d) $9 + R_H$
B

---

912. The emission or absorption of energy by an atom is represented by ΔE = 2010-10 Med:
(a) $h\upsilon$ (b) ½ mv^2
(c) Mgh (d) Mc^2
A

---

913. Bohr predicted the radius of the orbit of the electron in hydrogen atom to be: $\mathbf{r} = \frac{n^2 \epsilon^0 h^2}{e^2 \pi m}$. If electron moves from n = 1 to n = 2, by how much times the radius of the orbit will increase?
(a) 2 times (b) 3 times
(c) 4 times (d) 5 times
C
$r_n = r_1 n^2 \Rightarrow r_2 = r_1(2)^2 = 4r_1$

---

914. The energy of electron in the excited state n=4 in hudrogen atom is: 2010-174 Med:
(a) -13.6eV (b) -3.4eV
(c) -0.85eV (d) -1.5eV
C
$En = \frac{-13.6}{n^2} = E4 = \frac{-13.6}{(4)^2} = \frac{-13.6}{16} = -0.85ev$

---

915. A ball of mass 1 gram is moving with a velocity of $10^3\ m - s^{-1}$ .The De-broglie wavelength of the ball is: 2009-172 Med:
(a) $13.26 \times 10^{-36}\ m$ (b) $3.315 \times 10^{-34}\ m$
(c) $6.63 \times 10^{-34}\ m$ (d) $4.97 \times 10^{-36}\ m$
C
m = 1gram = $\frac{1}{1000}$ = 0.001kg, $\lambda = \frac{h}{mv}$
$= \frac{6.63x10^{-34}}{0.001x10^3}$ = 1000 = $6.63x10^{-34}$m

---

916. The energy level of an electron in a hydrogen atom are given by $E = \frac{13.6}{n^2}$ where n-1,2,3……… the energy required to excite an electron state is: 2015-136 Eng
A) 3.4ev B) 4.5ev
C) 10.2ev D) 13.6ev
D
$E = \frac{13.6}{n^2}$&As In hydrogen atom n=1,
Thus $E = \frac{13.6}{(1)^2}$=**13.6Ev,**

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917. The total energy of a H-atom in its ground state is: 2012-26 Eng:
(a) Zero (b) Negative
(c) Positive (d) Can be both (b) & (c)
B

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918. The functional group region in infra-red spectrum lies between: 2016-30 Med
(a) 500 – 1300cm^{-1} (b) 600 – 1500cm^{-1}
(c) 1500 – 4000cm^{-1} (d) 2500 – 3500cm^{-1}
C

---

919. The ground state energy of H-atom is 13.6 eV. The energy needed to ionize H-atom from its second excited state is: 2016-160 Med
(a) 1.51 eV (b) 3.4 eV
(c) 13.6 eV (d) 12.1 eV
a

X-rays& Its Properties,LASER:

920. X-rays with lowest energy is: 2018-Eng
A.Kα B)Lα C
c)K_β D)Kγ
D

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921. n helium neon LASER, the laser light arises from a transition from a ____ state to _____. 2015-94 Eng
A) He-He B) Ne-Ne
C) He-Ne D) Ne-He
D

---

922. X rays are: 2015-32 Med
A) Electromagnetic waves B) Negatively charged ions
C) Rapidly moving electrons D) Rapidly moving protons
A

923. A LASER beam can be sharply focused because it is: 2015-168 Med — D
A) Highly coherent B) Intense
C) Place polarized D) Highly directional

924. The excited state which persists for unusually longer period of time is called: 2011-Eng:: 2007Med: — C
(a) Ground state (b) Ionized state
(c) metastable state (d) ordinary excited state

925. The best shield against x-rays to absorb it is; 2010-139 Med: — A
(a) Lead (b) Steel
(c) Iron (d) Copper

926. Ultraviolet rays differ from the X-rays in that ultraviolet rays: 2013-39 Med: — C
(a) Cannot be diffracted (b) Cannot be polarized
(c) Have a low frequency (d) Do not affect a photographic plate.

927. The intensity of x-rays depends upon; 2011-183 Eng: — A
(a) filament current (b) nature of material of target
(c) operating voltage (d) All of these

928. When the voltage of the target in the X – ray tube increases then the; 2011-185 Med: — A
(a) penetrating power of x – ray increases
(b) intensity of x – ray increases
(c) wavelength of x – ray increases
(d) all of these

929. The penetrating power of x rays depends upon. 2010-198 Eng: — B
(a) Filament current (b) operating voltage
(c) The nature of the filament (d) none of these

930. Choose the region of the spectrum which would be used to determine the structure of crystalline solids: 2011-156 Med: — C
(a) visible (b) infrated
(c) X– rays (d) ultraviolet

931. Laser light is the result of; 2007-184 Med: — D
(a)Spontaneous emission (b) Ordinary emission
(c) Absorption of radiation (d) Stimulated emission

932. The excited state of an atom which can persist for unusual longer time is called; 2007-48 Med: — A
(a) Metastable state (b) Ground state
(c) Excited state (d) Normal state

933. The situation in which then excited state i.e. metastable state contains more number of electrons than the ground is called: 2011-188 Med: — C
(a) Ionized state (b) Stimulations
(c) Population inversion (d) All of these

934. If 50 KV is the applied potential in ax X-ray tube then minimum wavelength of X-rays produced is: 2016-10 Med — C
(a) 0.2 nm (b) 2 nm
(c) 0.02 nm (d) 2A

eV_0 =hc/λ → λ=hc/eV_0 =0.24x10^{-10}m =0.024x10^{-9}m=0.024n

935. X-rays are widely used as a diagnostic tool in medicine because of its: 2016-64 Med — C
(a) Particle property (b) Cost of X-ray unit is low
(c) High penetrating power (d) It is not electromagnetic waves

936. A laser beam can be sharply focused because it is: 2016-92 Med — D
(a) Highly coherent (b) Plane polarized
(c) Intense **(d) highly directional**

937. Soft X-rays have: 2016-153 Eng — b

(a) High energy **(b) Low energy**
(c) High frequency (d) Refracted by heavy atom

CHAPTER-20: NUCLEAR PHYSICS

Atomic Nucleus,Isotopes,Mass Defect & Binding Energy:			
938.	In what way do the atoms of the isotopes ${}^{12}_{6}C$, ${}^{13}_{6}C$ and ${}^{14}_{6}C$ differ? 2018-Med A) different charges B)different number of electrons C)different number of neutrons D) different number of neutrons	D	Isotopes have same atomic number but different mass number due to different number of neutrons.
939.	How many nucleons are there in an atom of ${}^{235}_{92}U$? 2011-145 Eng: (a) 92 (b) 235 (c) 123 (d) 327	B	Protons & neutrons are collectively called nucleons,
940.	The sum of the number of protons and the number of neutrons present in the nucleus of an atom is known as: 2008-63 Med; (a)Charge number (b)Mass number (c) Atomic number (d)Magic number	B	
941.	The atoms of an element having same atomic number but different mass number are called.2010-102 Eng: (a) Isotones (b) Isotopes (c) Isobars (d)Isomers	B	
942.	How is it possible to distinguish between the isotopes of uranium.2013-139 Eng: (a) their nuclei have different charge and different mass, and they emit different particles when they decay. (b) Their nuclei have the same charge but different mass (c) Their nuclei have different charge but the same mass (d) Their nuclei have the same charge and mass, but they emit different particle, when they decay.	B	
943.	The amount of energy required to break the nucleus into constituent nucleous is called: 2011-189 Eng: , 2010-194 Med: (a) ionization energy (b) exaltation energy (c) binding energy (d) work function	C	
944.	The expression for binding energy is: 2012-34 Med; (a) $E_B = fh$ (b) $E_B = [(ZM_P + N M_n\} - {}_ZM^A]C^2$ (c) $E_B = ZM_PC^2 + N M_n {}_ZM^A C$ (d) $E_B = ZM_P + N M_n - M C^2$	B	
945.	The binding energy per-nucleon is greater for: 2012-91 Eng: (a) lighter nuclei (b) heavy nuclei (c) intermediate nuclei (d) None	C	
946.	Which statement correctly describes a nucleon? 2014-114 Med: (a) Any atomic nucleus (b) A radioactive atomic nucleus (c) A neutron or a proton. (d) A neutron proton or an electron.	C	

947. In a nuclear reaction $^{238}_{92}U \rightarrow ^{A}_{Z}Th + ^{4}_{2}He$ the value of A and Z are ; 2015-184 Eng — C
A) A= 234, Z=94 B) A=238, Z=94
C) A=234, Z=90 D) A= 238, Z= 90

948. Atomic mass unit (amu) in term of energy is nearly equal to: 2006-21 Med: — B
(a) 931 KeV (b) 931 MeV
(c) 39 MeV (d) 139 KeV

949. The rest mass energy of electron is: — A
(a) 0.51 joule (b) 1.02 joule
(c) $9.11x10^{-32}$ joule (d) $8.2x10^{-14}$ joule

950. Which two nuclei contain the same number of neutrons? 2016-12 Eng — c
(a) $^{12}_{6}C$ and $^{14}_{6}C$ (b) $^{16}_{7}N$ and $^{15}_{8}O$
(c) $^{23}_{11}Na$ and $^{24}_{12}Mg$ (d) $^{32}_{14}Si$ and $^{32}_{15}P$

Radioactivity,Alpha,Beta & Gamma Emission:

951. Which of the following will be a better shield against y-rays? 2018-Med — C
a)Ordinary water b)Heavy water
c)Lead d)Aluminum

952. The nuclear equation shown has a term missing. — A
$^{14}_{6}C \rightarrow ^{14}_{7}N + ^{0}_{-1}\beta +$ ………… What is represented by the missing term? 2010-Med, 2016-Eng
A)An antineutrino B)An electron
C)A neutrino D)A positron

953. When lead, $^{214}_{82}Pb$, emits a β^{-1} particle, the resultant nucleus will be; 2018-Eng — A
A) $^{214}_{83}Bi$ B) $^{214}_{82}Po$
C) $^{214}_{82}Pb$ D) $^{214}_{82}Tl$

954. In the nuclear reaction shown below what is the value of coefficient "y"? 2018-Eng — D
$^{235}_{92}U + ^{1}_{0}n \rightarrow ^{141}_{53}Ba + ^{92}_{36}Kr + y^{1}_{0}n + 200Mev$
A) 0 B) 1
C) 2 D) 3

955. Which equation represents β- decay? 2017-Eng — D
A. neutron → proton + positron + antineutrino
B. neutron → proton + positron + neutrino
C. proton → neutron + positron + antineutrino
D.proton → neutron + positron + neutrino

956. The isotope which decay by β^{-1}emission to produce $_{48}Cd^{111}$ is; 2015-148 Med — D — Emission of β^{-1} particle increase the atomic number by 1,
A) $_{47}Ag^{111}$ B) $_{47}Ag^{110}$
C) $_{47}Ag^{112}$ D) $_{49}In^{111}$

957. An atom has a net charge of -1. it has 18 electrons and 20 neutrons. Its mass number is; 2008-04Med — C — Because; it has given one ē, Which is not considered in mass number.
(a) 38 (b) 39
(c) 37 (d) 20

958. Which of the following has the same number of electrons as an alpha particle? 2010-74 Med: — C — Because alpha particles have no electrons
(a) H (b) H_2
(c) H^+ (d) H_2O

959. Gamma rays have high penetrating power than α & β ray due to: 2010-116 Med: — D

(a) No charge (b) Non material nature
(c) Small size (d) Lighter particles

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960. When α particle is emitted by radium $_{88}Ra^{226}$ the daughter nucleus is radon the mass number and charge number of which will be: 2013-185 Eng:
(a) $_{90}Rn^{220}$ (b) $_{86}Rn^{222}$
(c) $_{89}Rn^{226}$ (d) $_{90}Rn^{222}$
Answer: B

---

961. A particle was ejected from the nucleus of an atom in a radioactive decay and atomic number of the atom increased. The particle was probably; 2005-08 Med:
(a) A proton (b) A neutron
(c) An alpha particle (d) A beta particle
Answer: D

---

962. When β-particle is emited from lead $_{82}Pb^{214}$ the mass number and charge number of Bismuth formed is; 2007-92 Med:
(a) $_{83}Pb^{214}$ (b) $_{81}Pb^{214}$
(c) $_{85}Pb^{214}$ (d) None of the above
Answer: A
Emission of β^{-1} particle increase the atomic number by 1.

---

963. In the nuclear reaction; 2012-171 Med:
$_{11}Na^{24} \rightarrow {}_{12}Mg^{24}$ + X, the particle X is;
(a) Electron (b) Positron
(c) Proton (d) Neutron
Answer: A

---

964. A zirconium nucleus,is a ß-emitter. The product nucleus is also a ß-emitter. What is the final resulting nucleus of these two decays? 2013-19 Med:
(a) $^{100}Sr_{38}$ (b) $^{100}Mo_{42}$
(c) $^{98}Zr_{40}$ (d) $^{102}Zr_{41}$
Answer: B

---

965. When lead, $_{81}Pb^{214}$, emits a ß- particle, the resultant nucleus will be:
(a) $_{82}Bi^{214}$ (b) $_{84}Po^{214}$
(d) $_{82}Pb^{213}$ (d) $_{41}Tl^{214}$
Answer: A
Emission of β^{-1} particle increase the atomic number by 1

---

966. Radium $_{48}R^{226}$ when disintegrates into $_{46}R^{222}$ causes the emission of: 2011-193 Eng:
(a) $\alpha -$ radiation (b) $\gamma -$ radiation
(c) $\beta -$ radiation (d) cosmic rays
Answer: A

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967. The following reaction might be used for controlled nuclear fusion;: $_3Li^7$ + $_1H^2 \rightarrow 2({}_2He^4)$ + X. What is the particle X? 2005-09 Med
(a) An α-particle (b) An electron
(c) A neutron (d) A proton
Answer: C

---

968. The path traced by β particles in air is: 2016-163 Med
(a) Straight **(b) Erratic**
(c) Circular (d) Elliptical
Answer: B
The path traced by α particles in air is Straight

---

969. Which of the following has the same number of electron as an alpha particle; 2016-109 Eng
(a) He (b) H
(c) H^+ (d) Li^+
Answer: C
Because H^+ like alpha particles have no electrons..

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970. A radium atom, ^{226}Ra (Z = 86) emits an alpha particle. The number of protons in the resulting atom is:
(a) 84 (b) 85
(c) 86 (d) 88
Answer: a

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971. A nucleus with mass number A and atomic number Z undergoes β decay. The mass number and atomic number, respectively, of the daughter nucleus are: 2016-193 Eng
(a) A, Z - 1 (b) A – 1, Z
(c) A + 1, Z **(d) A, Z + 1**
Answer: d

Nuclear Decay.Half Life:

972. Radio active substance has a half-life of 60 minutes. During 3 hours, the percentage of the material that decayed would be: 2017 Med
A. 12.5% B. 87.5%
C. 8.5% D. 25.1%
B

973. The activity of a certain nuclide is governed by the relation $\frac{\Delta N}{\Delta t} = -\lambda N$,where 2.4x 10^{-8} s^{-1},what is the half-life of the nuclide? 2018-Med
a)2.9x 10^{7} s b)1.3 x 10^{7} s
c)1.2 x 10^{-8} s d)3.4x 10^{-8} s
A

974. Two radioactive samples S1 and S2 have half-lives 3 hours and 7 hours respectively. If they have the same activity at certain instant t, what is the ratio of the number of atoms of S1 to S2 at instant t? 2018-Med
A)9:49 B)49: 9
C)3: 7 D)7:3
C

975. A radioactive isotope has a half-life of 3 days. The time after which its activity is reduced to 6.25% of its original activity is: 2018-Med
A)6 days B)8 days
C)12 days D)16 days
C

976. A medical lab has a 16g of sample of radioactive isotopes. After 6 hours it was found that 12g of sample have decayed. The half-life of the isotope is: 2018-Eng
A)12 hours B)6 hours
C)2 hours D)3 hours
D

977. A source contains initially N_o nuclei of a radioactive nuclide. How many of these nuclei have decayed after a time interval of three half-lives? 2018-Eng
A) $N_o/8$ B) $2N_o/3$
C) $N_o/3$ D) $7N_o/8$
D

978. The half-life of a radioactive source is 2.3 days. Its decay constant per day will be:
(a) 0.1 (b) 0.2
(c) 0.3 (d) 2.3
C
Half life) $T_{1/2} = \frac{0.693}{\lambda} = \lambda = \frac{0.693}{T_{\frac{1}{2}}} = \frac{0.693}{2.3} = 0.3$

979. The half-life of $^{22}Na_{11}$ is 2.6 years. If X grams of this sodium isotope are initially present, how much is left after 13 years? 2013-152 Eng: 2014-158 Med.
(a) X/32 (b) $\frac{X}{2^n}$
(c) $\frac{X}{25}$ (d) $\frac{X}{32}$
A
Undecayed = $\frac{No}{2^n}$ (No → original sample=X) (n = number of Half live),Number of half life's = $\frac{13}{2.6}$ = 5
Remaining undecayed element= $\frac{No}{2^n} = \frac{X}{2^5}$=**X/32,**

980. A source contains initially N_0 nuclei of a radioactive nuclide. How many of these nuclei have decayed after a time interval of three half-lives? 2013-166 Med:
(a) $N_o/8$ (b) $2N_o/3$
(c) $N_o/3$ (d) $7N_o/8$
D
Remaining undecayed element= $\frac{No}{2^n} = \frac{No}{2^3}= No$ **/8**
Decayed=1- Undecayed =1- No **/8=7N_o/8**

981. Half life of given sample is 44 years. The sample will reduce to 50% of the original value after: 2012-38 Med:
(a) 22 years (b) 88 years
(c) 11 years (d) None of the above
D

982. Radioactive activity is affected by: 2012-39 Eng, 2013-139 Med:
(a) Temperature (b) Pressure
(c) Humidity level (d) None
Answer: D

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983. Radioactive materials can be identified by measuring their: 2010-73 Eng:
(a) Density (b) Hardness
(c) Ductility (d) Half life
Answer: D

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984. One disintegration per second is equal to; 2011-195 Med:
(a) one curie (b) one Becquerel
(c) one half life (d) all of these
Answer: B

---

985. Becquerel is the unit of: 2012-16 Eng:
(a) activity (b) decay constant
(c)half life (d) mean life
Answer: A

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986. The activity of the radioactive material can be expressed in the units of: 2012-185 Med:
(a) Curie (b) Becquerel
(c) Tesla (d) Both A) and B)
Answer: D

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987. The half-life of radium is about 1600 years if a rock initially contains 1g of radium, amount left after 6400 years will be about: 2015-95 Eng
A) 62mg B) 31mg
C) 16mg D) Less then 16mg
Answer: A

Remaining undecayed Element= $\frac{No}{2^n}$, Here; No → Original sample=1g=100mg & n = number of Half live i.e ;Number of half life's = $\frac{6400}{1600}$ = 4. Thus Remaining undecayed element= $\frac{100}{2^4}$= $\frac{100}{16}$=**62mg,**

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988. A radioactive substance has a half-life of four months. Three fourth of the substance will decay in. 2016-11 Eng
(a) 6 months **(b) 8 months**
(c) 12 months (d) 16 months
Answer: B

Three fourth (¾) decayed means ¼ is remaining
Remaining undecayed Element= $\frac{No}{2^n}$(No → original sample) (n = number of Half lives),
$\mathbf{2^n}$ = N^0/ Remaining undecayed Element
$\mathbf{2^n}$ = 1/4x 1 => $1/(1/2)^2$=$(1/0.5)^2$ =$(2)^2$
$\mathbf{2^n}$= $(2)^2$ => n=2 i.e number of Half lives =2
As one half-life is of four months So 2 half-lifes=**8 months**

---

989. A radioactive substance has a half-life of 60 minutes. During 3 hours the percentage of the material that decayed would be: 2016-53 Eng
(a) 12.5% (b) 87.5%
(c) 8.5% (d) 25.1%
Answer: A

---

990. The half-life of a radioactive isotope is 6.5 h. If there are initially 48×10^{32} atoms of this isotope, the number of atoms of this isotope remaining after 26 h is: 2016-141 Eng
(a) 12×10^{32} (b) 6×10^{32}
(c) 3×10^{32} (d) 6×10^4
Answer: C

Radiation Detector,Nuclear Fission & Fusion,Hadron,Lepton & Quarks:

991. The first artificial radioactive substance was made by bombarding aluminum $_{15}Al^{27}$, with α-particle. This produced an unstable isotope of phosphorus, $_{15}P^{30}$, What was the by product of this reaction? 2014-148 Med:
(a) An α-particles (b) A β-particles
(c) A γ-ray (d) A neutron
D

992. An example boson is a; 2015-156 Eng
A) Photon B) Electron
C) Neutrion D) Neutron
A

993. Fission fragments usually decay by emitting: 2015-177 Med
A) α-particles B) electrons and neutrons
C) Positron and neutrinos D) only neutrons
B

994. Nuclear fusion at the sun is increasing its supply of: 2015-178 Med
A) Hydrogen B) Helium
C) Nucleons D) Neutron
B

995. Any baryon is a combination of: 2015-179 Med
A) Three quarks B) Two quarks
C) Two quarks & an anti-quark D) One quark & one anti-quark
A

996. Fast neutrons can be slowed down by collisions with; 2007-85 Med:
(a) Electrons (b) Protons
c) Phonons (d) Photons
B
Fast neutron also slowed down by collision with protons.

997. Cadmium rods are used in a nuclear reactor for: 2008-133 Med:
(a)Slowing down fast neutrons (b) Speeding up slow neutrons
(c)Absorbing fast neutrons (d) Regulating the power level of the reactor
C

998. Reaction in which two or more light nuclei use together to form a single nuclide is categorized as: 2013-135 Eng:
(a) Nuclear fission (b) Chemical reaction
(c) Nuclear fusion (d) None of the above
C

999. The hadrons are; 2011-196 Eng:
(a) protons (b) neutrons
(c) mesons (d) all
D

1000. Which one of the following particles belongs to Hadron group? 2013-112 Eng:
(a) Neutrino (b) Proton
(c) Electron (d) Antineutrino
B

1001. Nuclear fission occurs when 2012-14 Eng:
(a) Light nucleus is split by neutrons
(b) Light nucleus is split by alpha particles
(c) Heavy nucleus is split by alpha heavy particles
(d) Heavy nucleus is split by neutrons.
D

1002. Uranium = 235 decays the thorium-234 by the process of 2011-176 Med:
(a) fission (b) beta decay
(c) alpha radiation (d) gamma radiation
A

1003. Which one of the following Isotopes of natural uranium undergoes reaction with slow neutran? 2008-07 Med
(a) U_{92} 235 (b) U_{92} 236
(c) U_{92} 238 (d) U_{92} 239
A

1004. What is the approximate mass of nucleus of uranium?
(a) 10^{-13} Kg (b) 10^{-20} Kg
(c) 10^{-23} Kg (d) 10^{-30} Kg
C

1005. Fission reaction can be produced in U_{92} 238 by 2011-198, Med
(a) fast neutrons (b) slow neutrons
(c) thermal neutrons (d) All of these
A

1006. The device in which the controlled fission chain reaction is maintained is; 2010-163, Med — D
(a) Cyclotron (b) betatron
(c) accelerator (d) Nuclear reactor

1007. In liquid metal fast breeder reactor, the moderator used is; 2013-145, Eng — D
(a) Graphite (b) Heavy water
(c) Boron rods (d) Not required

1008. A certain redionuclide decays by emitting an α-particle. What is the difference between the atomic numbers of the parent and the daoughter nuclides? 2014-11;Med — B
A) 1 B) 2
C) 4 D) 6

1009. Of the following one particle belongs to lepton group: 2014-32;Med — A
(a) Neutrinos (b) Proions
(c) Neutrons (d) Mesons

1010. In liquid metal fast breeder reactor the moderator used is: 2014-178 Med: — D
(a) Graphite (b) Heavy water
(c) Boron rods (d) Not required.

1011. Which species has no net charge? 2014-149 Med: — D
(a) An α-particles b) An electron
(c) A proton (d) A neutrino

1012. Carbon-14 is used in carbon dating. Which of the following species has both same number of neutrons and same number of electrons as in atom of c-14? 2014-163 Med: — B
(a) $^{14}_{7}N^{+}$ (b) $^{16}_{8}O^{2+}$
(c) $^{17}_{9}P^{+}$ (d) $^{18}_{14}SI$

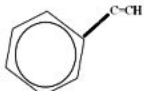
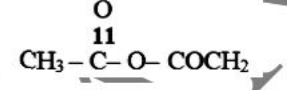
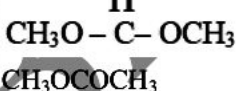
1013. Choose the correct Statement: 2014-111 Med: — C
(a) $_2Li^7 + {_2He^4} \rightarrow {_5B^{10}} + {_1n^0}$ (b) $_2Li^7 + {_2He^4} \rightarrow {_5B^9} + {^1_0P}$
(c) $_4Be^9 + {_2He^4} \rightarrow {_6C^{12}} + {_0n^1}$ (d) $_4Be^9 + {_2He^4} \rightarrow {_6C^{12}} + {_1p^1}$

1014. A neutron with K.E equal to 0.04ev is called? 2016-109 Med — D
(a) Slow neutron (b) Thermal neutron
(c) Fast neutron **(d) Both (a) and (b)**

1015. Nuclear fusion in the sun is increasing in supply of: 2016-25 Med — B
(a) Hydrogen **(b) Helium**
(c) Nucleons (d) Positrons

1016. In a nuclear reaction there is conservation of: 2016-61 Eng — D
(a) Only mass (b) Only energy
(c) Only momentum **(d) All of the above**

1017. The function of the control rods in a nuclear reactor is to: 2016-152 Eng — D
(a) Increase fission by slowing down the neutrons
(b) Decrease the energy of the neutrons without absorbing them
(c) Increase the ability of the neutrons to cause fission
(d) Decrease fission by absorbing neutrons

1^{ST} YEAR CHEMISTRY

ETEA Medical+Engineering 2019

1. A molecule which contains two lone pairs and two bond pairs of electrons in valence shell of central atom, geometrical shape of molecules will be; **2019-Med** — C
   a) tetrahedral
   b) triognal pyramidral
   c) angular
   d) linear
   ans; c

2. Quantum number which describes the orientation of orbitals in three dimensional space is **2019-Med** — C
   a) spin quantum number
   b) azimuthal quantum number
   c) magnetic quantum number
   d) principal quantum number
   ans; c

3. Which one of the following gas has the highest rate of diffusion at same temperature and pressure? **2019-Med** — C
   a) HCL
   b) CO2
   c) C2H2
   d) C2H6
   ans; c
   reason ; because C6H6 has least molecular mass than other and rate of diffusion is inversely proportional the molecular mass, this is according to the graham law of diffusion.

4. At higher altitude , the boiling point of water is less than 1000c, this is because of **2019-Med** — D
   a) higher atmospheric pressure
   b) weak hydrogen bonding
   c) no change in atmospheric pressure
   d) lower atmospheric pressure
   ans; d
   reason: at higher altitude atmospheric pressure is lower so water boils at high temperature.

5. Substance that has sharp melting point in the following is . **2019-Med** — D
   a) gemstone
   b) coal tar
   c) glass
   d) diamond
   ans; d
   reason; as compared to amorphous solids , crystalline solids have sharp melting point , so here crystalline solid is diamond, others options are amorphous.

6. Which one of the following pair is an example of completely immiscible liquids **2019-Med** — D
   a) alcohol and water
   b) alcohol and ether
   c) water and ether
   d) carbon disulphide and water
   ans;d
   reason; immisible liquids are
   a. carbon disulphide and water
   b. benzene and water

7. Which one of the following is not a state function? — A
   a) Work
   b) enthalpy
   c) internal energy
   d) pressure

8. How many elements are there in the 3 period of periodic table? — B
   a) 18 b) 8
   c) 32 d) 10

9. The number of isomers of pentane is — D
   a) 2 b) 4
   c) 5 d) 3

10. When ammonium cyanide (NH4 CN) salt is dissolved in water the solution will be — C
    a) Neutral b) acidic
    c) basic d) both b and

11. The enzyme which is found in saliva, accelerates the conversion of starch into sugar is; — C
    a) Pepsin b) thrombin
    c) Ptyalin d) Fumarase

12. Consider the reversible reaction. — D
    N2 + 2NH3 ⇌ 2NH3 +Heat
    The yield of NH, will be maximum at
    a) High temperature and low pressure
    b) High temperature and high pressure
    c) Low temperature and low pressure
    d) Low temperature and high pressure

13. When zinc electrode is coupled with copper electrode in a galvanic cell — C
    a) Reduction takes place at zinc electrode
    b) Oxidation takes place at copper electrode
    c) Reduction takes place at copper electrode
    d) Botha and b

14. Ozone layer in upper atmosphere is being destroyed by — D
    a) Chlorofluorocarbon b) freon
    c) smog d) both a and b

15. In the complex, potassium hexacyanoferrate (III). K3 Fe(CN6)l, the coordination number of Fe is; — C
    a) 9 b) 3
    c) 6 d) 5

16. The compound which has the highest — B

boiling point in the following is
a) Methyl chloride b) methyl iodide
c) methyl bromide d) both a and b

17. Which one of the following is addition polymer! — D
a) Nylon b) PVC
c) polythene d) both b and c

18. Photochemical smog is primarily caused by — B
a) O3 b) NO2
c) SO3 d)CO2

19. Which of the following is not the major source of organic compound? — D
a) Natural gas b) petroleum
c) Coal d) ammoniacal liquor

20. Which one of the following concentration units is temperature dependent — C
a) Molality b) mole fraction
c) Molarity d) both a and

21. Tertiary alcohols are not oxidized into carbon compounds because — B
a) They contain more alkyl group
b) They have no alpha-hydrogen
c) Suitable oxidizing agent is not available
d) None of the above

22. Which one is more reactive? **2019-Med** — A
a) HCHO b) CH3 CHO
c) (CH3)2CO d) have equal reactivity

23. Which compound shows the highest boiling point? **2019-Med** — A
a) CH3COOH b) C2 H5 OH
c) C2 H5 -0 C2 H5 d) (CH3CH2)3N

24. Which contains more atoms? **2019-Med** — B
a) 7 gram Mg b)8 gram Na
c)9 gram A d) all same

25. Which contains highest percentage of nitrogen? **2019-Med** — C
a) NO b) NO2
c) N2O d) N2O5

26. Fe+2 will form the most ionic bond with **2019-Med** — D
a) N-3 b) S-2
c)P-3 d)F-1

27. For exothermic reversible reaction activation energy for forward direction depends upon **2019-Med** — D
a) Temperature b) nature of reactant
c) nature of product d) both a and b

28. As the polarizing power of cation increases thermal stability of carbonates **2019-Med** — B
a) Increases b) decreases
c) not dependent d) depends upon pressure

29. Which one is more reactive? **2019-Med** — B
a) Ester b) acid halide
c) amide d) acid anhydride

30. Which of the following elements has lowest first ionization energy? — D
a) N b)O
c) C d) B

31. The anhydride of HClO4 is — D
a) ClO3 b) ClO2
c) Cl2 O5 d) Cl2 O7

32. A gas diffuse 12 times as fast as hydrogen, its molecular mass is — D
a) 50 amu b) 25 amu
c)16 amu d) 8 amu

33. Which one of the following ions has more electrons than protons and more protons then neutrons? — C
a)D b)d-
c)H- d) He

34. Ice and water is in equilibrium with each other. By increasing the pressure the equilibrium will shift in — A
a) Forward
b) reverse
c) to all system at equilibrium
d) None of the above

35. Steam causes severe burns than boiling water. It is due to — B
a) Absence of hydrogen bonding
b) High latent heat of vaporization
c) Freely moving molecules
d) Statement is incorrect

36. The bond that is formed between two monosaccharide units is called — D
a) ionic bond b) hydrogen bond
c) peptide bond d) Glycosidic bond

37. They already some of the old ones and them more comfortable — C
a) Repair, make b) repaired, made
c) repaired, make d) repair, made

38. I was born in Peshawar but most of my childhood in the Mardan — B
a) Spends b) have spent
c) was spending d) is spending

39. Which oxides of "K"contain more oxygen than its normal oxide? — B
a) Peroxide
b) super oxide
c) both contain equal quantity
d) none of the above

40. A gas decolorizes alkaline KMnO4 solution but does not give any PPT with ammoniacal AgNO3 — B
a) Methane b) ethylene
c) ethane d) None of the

above

41. Why ethanoic acid is a stronger acid in the liquid ammonia than in water? — A
a) Ammonia is stronger base than in water
b) Ethanoic acid molecules form H-bonding with water
c) Ethanoic acid is more soluble in liquid ammonia than in water
d) None of the above

42. Which ions are used as catalyst in the reaction between persulfate ions and iodide ions? — B
a) Lead b) iron
c) copper d) chromium

43. Which one is stronger nucleophile? — C
a) C2H5O- b) C2H5S-
c) both are equally strong d) none of the above

44. Which one of the following elements has the largest second ionization energy — C
a) O b) F
c) Na d)N

45. Which of the following species has the maximum number if unpaired electrons — A
a) 02 b)O+2
c)O-2 d) O2-2

46. A mixture of 10cm of oxygen and 50cm of hydrogen is sparked continuously. What is the maximum theoretical decrease in volume? — D
a) 10cm3 b) I5cm3
c)20cm3 d) 30cm3

47. The oxidation state of nitrogen in NH.NO, are — A
a) 3 and 5 b) +5 and 3
c)-3 and -3 d) zero

48. Which equation relates to the first ionization energy of bromine? — B
a) Br(g) →Br-(g) + le-
b) Br(g) →Br+(g) + le-
c) ½ Br2(g) →Br-(g) + le-
d) ½ Br2(g) →Br+(g) + le-

49. Co-ordination number of [Co(en)2Cl2] is; — B
a) -2 b)6
c) 4 d) None of the above

50. An olefin "X"on ozonolysis gives CH3CH2 COCH3 and CH3COCH3 . The IUPAC name of X is. — B
a) 2-butene b) 2-3 di methyl-2-pentene
c) 2-Pentene d) 1-Hexene

51. He said, "you need not wait" Choose the correct indirect speech — A
a) He said that I need not wait
b) He said you needed to wait
c) He said that wait was not needed by you.
d) He said that you must not wait

52. Which one is more soluble in water? — C
a) Secondary amines b) tertiary amines
c) quaternary amines d) all are insoluble

53. The number of peaks given by ethane thiol in NMR spectrum are — B
a) 2 b)3
c)4 d) None of the above.

54. C4 H11 N gives the type of isomerism — A
a) Metamerism b) optical isomerism
c) tautomerism d) None of the above

55. The incorrect statement regarding gas having high value of coefficient of attraction — C
a) Easy to be liquefied
b) having higher critical temperature
c) less soluble in water
d) none of the above

56. which one can form more acidic oxide? — B
a)Sc b) Mn
c) V d) Ti

57. hydration of hydrocarbon give carbonyl compound, the general formula of that hydrocarbon is — C
a) CnH2n+2 b) CnH2n
c) CnH2n-2 d) both b and c

58. Ethylenediamine Diacetate is **2019-Med** — C
a) Didentate b) tridentate
c) tetradentate d) hexadentate

59. Epoxide obtained from isobutylene is further hydrolyzed in the presence of acid. The final product is **2019-Med** — C
a) 2.3-butanediol!
b) 1,2-butandiol
c) 2-Methyl-1.2-propandiol
d) all of them

60. In the direction of nitrogen in an organic compound. The appearance of Prussian blue coloration is due to the formation of — A
a) Fe4 (Fe(CN6)3
b) Na3 [Fe(CN6)
c) K3 Fe(CN)6
d) None of the above

61. The bond angle in HS is less than H O. it is due to — B
a) Small size of oxygen atom
b) Greater E N of oxygen atom
c) Oxygen contain two lone pairs of electrons
d) All of the above

62. The auxochrome not concern with Metanil yellow dye **2019-Med** — C
a) – SO3H b) -OH
c)-NH2 d) both a and c

63. Consider reversibility in free radical substitution reaction alkane then Kc value is smallest for **2019-Med** — C
a) Initiation step b) propagation step
c) Termination step d) all same

64. Pollutant which inhibit the synthesis of hemoglobin is — B
a) Hg b) Pb
c) Ni d) Ag

65. Which of the following alkyl halides shows higher reactivity? — D
a) R-F b) R-CI
c) R-Br d) RI

66. For a reversible reaction, the catalyst increases the speed of — C
a) Forward reaction
b) Backward reaction
c) Both forward and backward reactions equally
d) Forward reaction to a larger extent than backward reaction

67. $2N_2O_5 \rightarrow 4NO_2 + O_2$ this reaction is an example of _______ order reaction — A
a) 1^{st} b) 2^{nd}
c) 3^{rd} d) zero

68. Diamond and graphite are — C
a) Isomers b) isomorphs
c) allotropes d) both b and c

69. Metal sulfate that is comparatively more soluble in water is — A
a) $MgSO_4$ b) $CaSO_4$
c) $BaSO_4$ d) $SrSO_4$

70. CO_2 is a gas at room temperature but SiO_2 is solid., The reason is that — C
a) SiO is ionic
b) bonds in SiO2 are very strong
c) SiO2 is polymorphic
d) Si makes double bonds with O

71. Which one of the following compounds produce the lowest amount of heat of combustion? — D
a) 1-butene b) Trans-2-butene
c) cis-2-butene d) Isobutylene

72. During SN^2 mechanism, the nucleophile attacks on the substrate; — B
a) When C-X bond has broken
b) Before C-X bond has broken
c) When C-H bond has broken
d) After the formation of carbocation

73. Carat is the unit of purity of gold. 18 carat gold contains_____ % gold — B
a) 50-60 b) 70-75
c) 90-95 d) 99

74. Which one of the following reagents is used to distinguish between primary, secondary and tertiary alcohols? — C
a) Baeyer's reagent b) Tollen's reagent
c) Lucas reagent d) Nessler's reagent

75. As the attraction between the nucleus and the
foreign electron increases, the potential energy of the system — C
a) Increases
b) unaffected
c) decreases
d) first decrease then starts increase

76. The formation of but-2-ene always takes place through — A
a) SP^2 hybridization
b) SP^3 hybridization
c) SP^2, SP^3 both
d) SP, SP^3 both

77. Pentane $C_3 H_{12}$ at room temperature does not obey — D
a) Charles's law
b) boyle's law
c) Avogadro's law
d) all of the above

78. 20 cm^3 CH_4 gas was burnt in $10cm^3$ O_2 to produce CO_2 as — D
$CH_4 + 20_2 \rightarrow CO_2 + 2H_2O$
The limiting reagent in this reaction is
a) O b) CH
c) CO2 d) None of the above

79. NO_2 gas shows maximum absorption at about _______ nm — A
a) 400 b) 700
c) 200 d) 120

80. Color of the hair dye is mainly due to — C
a) Substituted alcohols
b) stearalkonium hectorite
c) meta substituted aniline
d) acetone

81. Which one of the following produces an NMR spectrum with more than one peak? — C
a) Ethane b) methane
c) butane d) cyclobutane

82. Which one of the following gases is the major contributor greenhouse effect? — B
a) Ozone b) CO_2
c) CH_4 d) NO_2

83. Oxidation number of Nickel in tetra carbonyl nickel $Ni(CO)_4$ is — C
a)+4 b) +3
c) 0 d)-2

84. Addition of HCN to acetone forms cyanohydrin. It is an example of — B
a) Electrophilic addition reaction
b) Nucleophilic addition reaction
c) Electrophilic substitution reaction
d) Nucleophilic substitution reaction

85. In ice there are H-Bonds and covalent bonds. What type of solid is it? — B
a) lonic b) covalent
c) molecular d) metallic

86. Which one of the following liquids is more — A

volatile?
a) Chloroform b) ethanol
c) water d) Glycerin

87. If the equilibrium constant Kc value for a certain reaction is very small, then — A
a) Reactants are in large amount
b) Products are in appreciable amounts
c) Reactants and products both are in appreciable amounts
d) In such a situation equilibrium cannot be obtained.

88. Which one of the following form acidic solution when dissolved in water? — C
a) Na_2CO_3 b) CH_3COONa
c) NH_4Cl d) K_2CO_3

89. Zinc and copper electrodes are connected for galvanic cell and salt bridge is also immersed in both the half-cell, the salt bridge will give cation to — B
a) Copper half cell
b) zinc half cell
c) both a and
d) None of the above

90. When $K_4[Fe_9CN_6]$ is dissolved in water. It will furnish ____ ions per molecule. — D
a) 10 b) 2
c) 6 d) 5

91. Choose the alkyne that on catalytic hydrolysis form an aldehyde — D
a) CH_3-C≡CH
b) C≡CH
c)CH_3-C≡C-CH_3
d) None of the above

92. The compound which you can say ester is — D
A) CH_3CONH_2
B) $CH_3-\overset{O}{\overset{||}{C}}-O-COCH_2$
C) $CH_3O-\overset{O}{\overset{||}{C}}-OCH_3$
DJ CH_3OCOCH_3

93. Which one is not endothermic process? — C
a) Atomization of I_2
b) electrolysis of water
c) condensation of vapors
d) both b and c

94. One mole of which of the following bucky ball will have more molecules? — D
a) C_{20} b) C_{50}
c) C_{60} d) all same

95. The possible peaks (chemical shifts values) for 1 chloro-2-propanol molecules are — C
3) 2 b) 3
c) 4 d) 7

96. For a balanced wheat stone bridge, the current through the galvanometer is — C
a) Maximum b) minimum
c) zero d) I μA

97. A metallic carbide on treatment with water gives out a colorless gas, which burns in air readily and gives a red precipitate with $CuCl_2$ and NH_4OH Identify the gas. — B
a) CH_4 b) C_2H_2
c) C_2H_4 d) C_2H_6

98. Acetamide on hydrolysis gives — B
a) Acetaldehyde b) acetic acid
c) ethyl amine d) ethanol

99. Which one of the following does not have carboxylic acid group? — C
a) Benzoic acid b) ethanoic acid
c) picric acid d) adipic acid

100. On chlorination, benzene forms single monochlorobenzene without any isomer. It proves that — B
a) Benzene is aromatic
b) All C-C in benzene are identical
c) All C-H bonds in benzene are identical
d) Benzene sometimes behaves as non-aromatic

101. Avogadro's constant in the number of — D
a) Atoms in 1g of He
b) molecules in 35.5g of chlorine
c) electrons present in 2g H
d) atoms in 24g of Mg

102. A given sample of $AICl_3$ contains 6.02 x 10^{20} Al^{3+} ions. The molecules of Cl^- will be — C
a) Ix 10^3 b) 3x 10^3
c) 3 x 10^4 d) 0.33x 10^3

103. The angular momentum of the hydrogen atom in ground state is equal to — A
a) h/2π b) 2h 2π
c) π/2h d) 2π/h

104. which electronic level will allow the hydrogen atom to absorb a photon but not emit? — A
a) IS b) 2S2p3d
c) 2p3d d) 3d

105. Which statement about the following molecules is incorrect? — D
a) NH_3 has pyramidal shape
b) CO_2 is linear
c) H_2O is angular
d) H_2S is linear

106. The molecule having zero dipole moment among the following — D
a) NH_3 b) $SnCl_2$
c) PH_3 d) CCl_4

107. For a gas when volume and pressure are Idm^3 and 2 atm respectively. What will be its new volume if the pressure is increased to 6 atm at constant temperature? — B
a ½ dm^3 b) 1/3 dm^3

c)1/4 dm^3 d) 2/3 dm

108. Vapor pressure of a liquid does not depend on — C
a) Temperature
b) intermolecular forces
c) amount of liquid
d) amount of solid dissolved in liquid

109. The process or systems that do not involve exchange of heat are called — D
a) Isothermal process
b)equilibrium process
c) thermal process
d) adiabatic process

110. When NH^4CI is added to a solution of $(NH_4)_2CO_3$, there will be? — B
a) Decrease in (NH_4^+) ions concentration
b) Decrease in CO_3^{-2} ions
c) No change in CO_3^- concentration
d) No change in concentration of any specie

111. The strongest base among the following is — D
a)Cl^- b) Br^-
c)I^- d) CH COO^{--}

112. During the discharge of lead acid battery — C
a) Pb is dissolved at the cathode
b) Pb is deposited at the cathode
c) $PbSO_4$ is formed at both anode and cathode
d) Concentration of H_2SO_4 increases

113. Acidic $KMnO_4$ can't be used for the estimation of — D
a) Ferrous ions b) oxalic acid
c) Potassium iodide d) Ferric ions

114. A compound X is orange red in color, when KOH is added to it, lemon yellow coloration is obtained, compound X is — B
a) K CrO b) KCr O,
c) KMnO4 d) PbS

115. Ozonolysis of 2-Methyl-2-butene yields — C
a) Only aldehyde
b) only ketone
c) both aldehyde and ketone
d) aldehyde and alcohol

116. Alkyl halides are reactive towards nucleophilic attack because — D
a) They are ionic in nature
b) The C-X bond is non-polar
c) They have nucleophilic carbon and bad leaving group
d) They have electrophilic carbon and good leaving group

117. Methyl alcohol on oxidation with acidified $K_2Cr_20_7$, gives — C
a) CH_3COCH_3 b) CH_3CHO
c) HCOOH d) CH_3COOH

118. Aldehydes are reducing agents, in the reaction with Fehling's solution they reduce — A
a) Cu^{+2} ions b) Ag^+ ions
c) NaOH d)Na

119. In ice the water molecules are bounded by — B
a) ionic bonds b) hydrogen bonds
c) covalent bonds d) metallic bonds

120. The property of crystalline solid necessary to maintain habit of crystal is called — C
a) Crystal lattice b) lattice site
c) geometrical shape d) Polymorphism

121. The dispersion phase and dispersion medium for soap lather is respectively — B
a) Gas and solid b) gas and liquid
c) liquid and liquid d) solid and liquid

122. Which one is not correct for the stability of colloidal solution? — B
a) Greater charge density on colloid
b) Less salvation energy
c) More Brownian motion
d) None of the above

123. Which one of the following has highest melting point? — A
a) NaCl b) $MgCl_2$
c)$AlCl_3$ d) $SiCl_4$

124. The main product obtained when acetic acid reacts with PCIS? — A
a) CH_3COCI b) CCl_3CHO
c) CH_3Cl d) CH_3OH

125. Hydrolysis of an ester in the presence of alkali is called — C
a) Esterification b) Transesterification
c) saponification d) Decarboxylation

CHAPTER-1: STOICHIOMETRY

126. Phosphorous exists in nature as tetra atomic molecule. The number of atoms present one gram molecule of phosphorous are: `2018- Eng — D
A) $6.0323x10^{23}$ B) $2x6.023x10^{23}$
C)$3x6.023x10^2$ D)None of the above

127. Which compound with the given information has greater mass in Kg? 2018- Eng
A) 22.4 km^3 N2 at STP B)2 mole of CO
C) 6.02×10^{23} molecules of C_2H_4 D)All have equal mass

Answer: D

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128. $2KClO_3 \rightarrow 2KCl + 3O_2$
Molecular mass of $KClO_3$ = 122.5 g/mol for the production of 33.6 dm^3 of O_2 at STP the mass of $KClO_3$ to be decomposed is: 2018-Eng
A)245.0g B)61.25g
C)122.5g D)367.5g

Answer: C

---

129. The volume of CO_2 produced by heating 33.5g Li_2CO_3 at room temperature and pressure is (Mr Li_2CO_3 67g/mol): 2018-med
A)22 4 dm^3 B)12.0 dm^3
c)11.2 dm^3 D)24,0 dm^3

Answer: B

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130. The number of gram atoms in 3g Hydrogen atoms is the same as the number of gram atoms in 48g of
2018-Med
a) N B) C
c) O D) O_2

Answer: C

---

131. Which of the following is a compound? 2007-148 **MEd]**
(a) NH_3 (b) Air
(c) Brass (d) O_2

Answer: A

Brass —> Alloy (Made of Cu + Zn), O2 —> Molecule

---

132. Na^+ is Iso-electronic with: 2006-12 **MEd]**
(a) Mg (b) He
(c) Fe (d) Ne

Answer: D

Na+ = 10 ê, Ne = 10e —>Both are Iso-electronic

---

133. Which of the following pairs have same electronic structure? 2006-44**MEd]**
(a) Ar & Cl^- (b) Ca & Ar
(c) Mg & Na^+ (d) Ag & Sn

Answer: A

Ar &**Cl^-** are Iso-electronic between both have 18 e.

---

134. The anion size are larger than its atomic size because, **[2011**-03**MEd]**
(a)The addition of electron occupies more space
(b) It increases the effective nuclear charge
(c) The repulsion between electrons increases with the addition of electron
(d) The attraction between electrons and the nucleus increases

Answer: C

---

135. Natural chlorine occurs as a mixture of isotopes if a mixture contains 75% Cl^{35} and 25% Cl^{37} what will be its correct atomic weight? **[2010**-58 **MEd]**
(a) 35.50 b) 34.50
(c) 72.00 (d) 70.00

Answer: A

Amount of $Cl^{35} = \frac{75}{100} = 0.75$,
Amount of $Cl^{37} = \frac{25}{100} = 0.25$
Average atomic weight = (Amount) (At: Mass of 1st isotope) + (Amount) (At mass of 2nd isotope)
= (0.75) (35) + (0.25)(37) = 26.25 + 9.25 = **35.5**

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136. How many hydrogen atoms are present in one mole of water? **[2012**-104 **Eng]**
(a) 6.02×10^{23} atoms (b) 1.806×10^{74} atoms
(c) 1.204×10^{24} atoms (d) 3.01×10^{23} atoms

Answer: C

To find # ofAtom= $n \times N_A \times$ # of Atom in formula
$= 1 \times 6.02 \times 10^{23} \times 2$
$= 12.04\times 10^{23} = 1.2 \times 10^{24}$ atoms

---

137. The number of oxygen in 0.5 mole of $Al_2(CO_3)_3$ is 2005-124 **MEd]**
(a) 4.5×10^{23} (b) 3.6×10^{24}

Answer: C

#of Atoms = n × NA × # of Atoms in formula $0.5 \times 6.02 \times 10^{27} \times 9 = 27.09 \times 10^{23} \Rightarrow 2.7 \times 10^{24}$ atoms

(c) 2.7×10^{24} (d) 9.0×10^{23}

---

138. A sample containing aluminum weighing 10.0g yielded 2.0g of aluminum sulphide. What is the percentage of aluminum (atomic mass = 27.0) in the sample? Sulphur (atomic mass = 32.0) **[2011-153 MEd]**

(a) $\frac{2.0\times100}{10.0}$ (b) $\frac{2.0}{10}\times\frac{2\times27}{150}\times100$

(c) $\frac{2.0}{10.0}\times\frac{27}{1500}\times100$ (d) $\frac{2.0}{10.0}\times\frac{150}{3\times27}\times100$

B

Formua of Aluminum Sulphide= Al_2S_3

%age of an Element = $\frac{\text{Given Mass of Al} \times \text{Af: Mass}}{\text{Given Mass of organic Compounde}} \times \frac{\text{\# of atoms} \times \text{M.Mass of Al}}{\text{M.Mass of organic Compounde}} \times 100 = \frac{2.0}{10.0}\times\frac{2\times27}{150}\times100$

---

139. The sample of a compound contains 0.100g of hydrogen and 4.20g of nitrogen. The simplest formula for the compound is… 2005-165**MEd]**

(a) HN_2 (b) NH_3

(c) HN_3 (d) NH_2

B

---

140. Calculate the volume occupied by 2.8g of nitrogen gas at STP. 2005-66 **MEd]**

(a) 22.4 dm3 (b) 2.24 dm3

(c) 4.48 dm3 (d) 44.8 dm3

B

$n = \frac{V}{Vm} \Rightarrow v = n \times Vm$

$n = \frac{m}{M} = \frac{2.8}{28} = 0.1$

$V = 0.1 \times 22.4 = 2.24\ Dm^3$

---

141. How many atoms are contained in one mole of $Ca(OH)_2$? **[2012-62 MEd]**

(a) $5\times6.02\times10^{23}$ atoms (b) $30\times6.02\times10^{23}$ atoms

(c) $3\times6.02\times10^{23}$ atoms (d) $6\times6.02\times10^{23}$ atoms

A

# of Atoms = $n \times N_A \times$ # of Atoms in formula

$= 1 \times 6.022 \times 10^{23} \times 5$

$= (5 \times 6.02 \times 10^{23})$ Atoms

---

142. A gas at STP contains only 6.023×10^{23} atoms and is monatomic it will occupy. **[2010-115 MEd]**

(a) 1.2L (b) 22.4L

(c) 30.5L (d) 44.8L

B

$22.4dm^3 = 22.4L = 6.023\times10^{23}$ atoms

---

143. How many grams of waster are produced in burning $2.24dm^3$ of hydrogen at STP? **[2011-166 MEd]**

(a) 180g (b) 81.g

(c) 1.8g (d) 0.18g

C

2H2 + 02 ⇒ 2H20

2 mole 1 Mole 2 Mole

$n = \frac{V}{Vm} = \frac{2.24}{22.4} = 0.1 Moles$

$n = \frac{m}{M}, m = n \times M = 0.1\times18 = 1.89$

---

144. One mole is the amount of substance which contains as many elementary entities as contained in: **[2012-58 MEd]**

(a)0.12 kg of $_6C^{12}$ (b)1.2 kg of $_6C^{12}$ atom

(c) 0.012 kg of $_6C^{12}$ atom (d) 0.12 kg of $_8O^{16}$

C

One mole of C-12 = 12 g = (0.012 Kg)

---

145. Which one of the following contains the greatest number of atoms: 2008-122 **MEd]**

(a) 4g of Hydrogen (b) 4g of magnesium

(c) 71 g of chlorine (d) 127g of iodine

A

For H2 = $n = \frac{m}{M} = \frac{4}{1.008} = 4\ Mole$

For = Mg = $n = \frac{m}{M} = \frac{4}{24} = 0.16$

---

146. A sample of carbon-12 has a mass of 3.0 g. which expression gives the number of atoms in the sample? (N_A is the symbol Ion the Avogadro constant. **[2013-159 MEd]**

(a) $0.0030N_A$ (b) $0.25\ N_A$

(c) $3.0\ N_A$ (d) $4.0\ N_A$

B

$N = n \times N_A = n = \frac{m}{M} = \frac{3}{12} = 0.25$

$N = 0.25 \times N_A$

No.	Question	Ans	Explanation
147.	Four moles of electrons (4 x 6.02 x 10^{23} electrons) would electroplate how many grams of silver from a silver nitrate solution? 2008-145**MEd]** (a) 216 (b) 324 (c) 432 (d) 540	A	$AgNO_3 \longrightarrow Ag^{+3} + NO^{-3}$ (Ag = 108) $n = \frac{m}{M},\ m = n \times M$ m = 4 × 108 = 432
148.	How many molecules are present in 0.20 g of Hydrogen gas? **[2013**-28 **MEd]** (a) $\frac{0.20}{1.008}$x 6.02x 10^{23} (b) 0.20x 2.016 (c) $\frac{0.20}{2.016}$x 6.02x 10^{23} (d) $\frac{1.008}{0.70}$x 6.02 x 10^{23}	C	For number of particles = $N = n \times N_A$ $n = \frac{m}{M} = \frac{0.2}{2.016}$ $N = \frac{0.2}{2.016} \times 6.02 \times 10^{23}$
149.	1 amu is equal to 1.661 × 10^{-24}g, then 1.0 g will be equal to: **[2012**-52 **MEd]** (a) 6.022 × $1O^{23}$amu (b)6.022 × 10^{-23}amu (c) 6.022 × 10^{-24}amu (d)6.022 × 10^{24}amu	A	
150.	Calculate the number of moles of NaCl in 75.0g of table salt 2005-159 **MEd]** (a) 0.643 (b) 0.779 (c) 28.0 (d) 1.28	D	$n = \frac{m}{M} = \frac{75}{58} = 1.29$
151.	If water samples are taken from sea, river, clouds, lakes or snow, they will be found o contain hydrogen and oxygen in the ratio of 1:8 by weight. This indicates the law of2006-159 **MEd]** (a) Definite proportion (b) Multiple proportion (c) Reciprocal proportion (d) None of the above	C	
152.	10 L of Cl_2 gas reacts with 40L of H_2 gas under same conditions of temperature and pressure. How much volume of HCL should be produced? 2008-69 **MEd]** (a) 40L (b) 30L (c) 20L (d) 10L	C	
153.	If 28.0g nitrogen gas is reacted with 8.0g of hydrogen gas to form Ammonia, the limiting reactant among the two will be: 2008-54 **MEd]** (a) N_2 (b) H_2 (c) Bothe a & b (d) None of these	A	
154.	Choose the correct Statement: **[2014**-105 **MEd]**: (a)The most direct and accurate method for determining atomic masses uses mass spectroscopy. (b)The indirect but accurate method for determining molecular masses uses mass spectroscopy. (c)Collision between the electrons and the atoms produces negative ions by absorption of electrons by atoms or molecules. (d)The first application of the mass spectroscopy was the demonstration to detect various isotopes of argon.	D	
155.	Choose the correct relation about the percent yield. It is equal to: **[2014**-96 **MEd]**: a) $\frac{Actualyield}{Theoreicayield} \times 100$ b) $\frac{Theoreicayield}{Actualyield} \times 100$ c) $\frac{Actualyield}{Theoreicayield} \times 10^6$ d) $\frac{Actualyield}{Theoreicayield} \times 10^3$	A	
156.	What is the number of hydrogen atoms in 5 moles of water? **[2015**-55 **MEd]** A) 3.0115 × 10^{24} B) 6.023 × 10^{24} C) 6.023 x 10^{23} D) 5.0 x 10^{23}	B	# of Atoms = $n \times N_A$ × # of Atoms in formula (Atomicity) = 5× 6.022 × 10^{23} × 2=**6.023 × 10^{24}**
157.	$N_2 + 3H_2 \rightleftharpoons 2NH_3$ **.** In the above reaction the limiting reagent is: **[2015**-95 **MEd]** A) N_2 B) H_2 C) Ammonia D) None of the above	D	

158. Theoretical yield is always: **[2015**-134 **Eng]** B
A) Less then practical yield. B) Greater than actual yield
C) Both are equal D) None of the above

159. Which of the following is iso –electronic pair? **[2015**-192 **Eng]** B
A) Ne and Na B) Ne and Mg^{+2}
C) Al and c D) Ar and Ca

160. Consider the following reaction involved in the manufacture of Urea: $CO_2 + 2NH_3 \rightarrow NH_2\ COONH_4$ C
If 22.0g of CO_2 react with 34 g of ammonia to form ammonium carbamate, the reaction is taken as irreversible and go to completion. Identify the limiting reagent and the amount of carbamate for**MEd]**:
(a) CO_2, 78g (b) NH_3, 78g
(c) CO_2, 39g (d) NH_3, 39g

161. A ring contains 1.2gram of diamond, the number of carbon atoms in the ring are: **[2016**-78 **Eng]** A
(a) $N_A/10$ (b) N_A
(c) $N_A/2$ (d) 1.2 N_A

162. Cylinder "A" contain 4.6 grams of C_2H_5OH and cylinder "B" has 3 grams C_2H_6: **[2016**-79 **Eng]**
(a) Both cylinder A and B have equal number of molecules
(b) Cylinder A has greater number of molecules than cylinder B
(c) Both cylinders have the equal number of hydrogen atoms

163. DDT is used as insecticides its molar mass is 354.5g/mol when DDT was analysed by chemist he found that it contained 47.4% carbon. How many carbon atoms are there in DDT molecule: **[2016**-108 **Eng]** C
(a) 10 (b) 12
(c) 14 (d) 16

164. Which of the following species have the same number of neutron and electron as in C-14:[**2016**-127 En C
(a) ${}^{17}_{7}N^{=1}$ (b) ${}^{19}_{9}F^{+1}$
(c) $\mathbf{{}^{16}_{8}O^{+2}}$ (d) ${}^{28}_{14}S$

165. 60 a.m.u of C-12 contain carton: atoms **[2016**-157 **Eng]** B
(a) 60 **(b)** $\mathbf{60 \times 6.02 \times 10^{23}}$
(c) $5 \times 6.02 \times 10^{23}$ (d) 5

166. Balance the given equation by using the suitable coefficients from the following sets: A
$FeS_2 + O_2 \rightarrow Fe_2O_3 + SO_2$ **[2016**-189 **Eng]**
(a) 4:11:2:8 (b) 1:10:2:8
(c) 6:5:3:7 (d) 2:11:4:8

167. $2XeF_6 + SiO_2 \rightarrow 2XeOF_4 + SiF_4$ Consider the above chemical reaction. If 122.6 g of XeF_6 reacts with 60 g of SiO_2 to form the products. Select the limiting reagent and amount of SiF_4 for**MEd]**: (XeF_6 245.3 amu, SiO_2 = 60 amu, SiF_4 = 104 amu) **[2016**-28 **MEd]**s A
(a) XeF_6, 26 g (b) SlO_2, 26 g
(c) XeF_6, 52 g (d) SlO_2, 52 g

168. How many oxygen atoms are present in 278g of Hydrated Ferrous Sulphate? B
($FeSO_4$.7Hz 0 = 278 any) **[2016**-52 **MEd]**
(a) 6.023×10^{23} (b) 6.525×10^{24}

(c) 2.408×10^{23} (d) 6.023×10^{22}

---

169. Select the reaction when the supply of air is very limited. **[2016**-146 **MEd]** — D

(a) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ + heat
(b) $2CH_4 + 3O_2 \rightarrow 2CO_2 + 4H_2O$ + heat
(c) $CH_3 - CH_3 + 7O_2 \rightarrow CO_2 + 6H_2O$ + heat
(d) $2CH_4 + 2O_2 \rightarrow 2C + 4H_2O$ + heat

---

170. $2XeF_6 + SiO_2 \rightarrow 2XeOF_4 + SiF_4$ Consider the above chemical reaction. If 122.6 g of XeF_6 reacts with 60 g of SiO_2 to form the products. Select the limiting reagent and amount of SiF_4 for**MEd]**: (XeF_6 245.3 amu, SiO_2 = 60 amu, SiF_4 = 104 amu) **[2016**-28 **MEd]** — A

(a) XeF_6, 26 g (b) SlO_2, 26 g
(c) XeF_6, 52 g (d) SlO_2, 52 g

---

171. How many oxygen atoms are present in 278g of Hydrated Ferrous Sulphate? **[2016**-52 **MEd]** — B

($FeSO_4$.7Hz 0 = 278 any)
(a) 6.023×10^{23} (b) 6.525×10^{24}
(c) 2.408×10^{23} (d) 6.023×10^{22}

CHAPTER-2: ATOMIC STRUCTURE

172. For production of characteristic K, X-rays, the electron transition if from: 2018-04 Eng — C

A)n 3 to 2 B)n 1 to n-2
C)n 2 to no 1 D) n 2 to n-3

---

173. The magnetic quantum number for the last sub orbital having 3 electrons in phosphorous $^{15}{}_{31}P$ is: 2018-Eng — A

A)-1, 0, +1 B)-1, 0,--1
C)O,-1, +2 D)-1, +1,-2

---

174. If the required excitation voltage is given, for which element the x-rays spectrum consists of three spectral lines i.e. K_α kβ l_α 2018-Med — A

A)Na b) boron
C)K D)Ca

---

175. Energy of electron in first excited state of Hydrogen atom in atom is. 2018-med — B

a)2.8×10^{-18} b)0.545×10^{-18}
c)-2.18×10^{-18} d)-1312.36

Energy of 1st Excited state -3.4ev= $3.4 \times 1.6 \times 10^{-19}$ J/atom =-0.545×10^{-18} J/atom.

---

176. Which list shows electromagnetic waves in order of increasing frequency? 2018- Med — B

A) Radio waves →gamma rays→ ultraviolet → infra-red
B)Radio waves→infrared →ultraviolet →gamma rays
C) Ultraviolet→gamma rays→radio waves→ infrared
D) Ultraviolet →infra-red→radio waves →gamma rays

177. The charge on the electron and proton is reduced to half. If the present value of Rydberg constant is R., then the new value of Rydberg constant will be
2018-med
A) R/2 B)R/4
C)R/8 D) R/16
C

---

178. Two atoms A and Li have the electronic configuration given below: **[2015**-15 **MEd]**
(x) $IS^2 2S^1 2P^6 3S^1$ (y) $IS^2\ 2S^2 2P^5$
Which of the following compounds are they likely to form?
A) Xy B) Xy^2
C) X_1y D) Xy_3
A

---

179. The energy difference between adjacent energy levels of the hydrogen atom: **[2015**-26 **MEd]**
A) Increases with increasing energy
B) Decreases with increasing energy
C) First increases & then decreases with increasing energy
D) First decreases & then increases with increasing energy
B

---

180. In the discharge tube emission the cathode rays requires: 2008-74 **MEd]**:
a) Low potential and low prossure
b) low potential and high pressure
c) high potential and high pressure
d) high potential and low pressure
D

---

181. Particles involves in an ordinary chemical reaction are:2009-102 **MEd]**:
(a) Protons (b) Neutrons
(c) Electrons (d) All of the above
C

---

182. The constancy of e/m ratio for electron shows that ;
2006-137 **MEd]**:
(a) Electron mass is $1/837^{th}$ of proton
(b) Electrons are universal particles of all matter
(c) Electrons are produced in discharge tube only
(d) None of the above
B

---

183. The charge of electron was determined by the effect of electric field on rate of fall of oil droplets under gravity this was done by:**[2010**-125 **MEd]**:
(a) JJ Thomson (b) E Rutherford
(c) R.A. Milliken (d) WC Roentgen
C

---

184. Which of the following rays has the longest wavel**Eng**]th?
[2012-33 **Eng]**:
(a) Infrared rays (b) ultraviolet rays
(c) Gamma rays (d) x-rays
A

---

185. Continuous adsorption spectrum is obtained from 2005-77 **MEd]**:
(a) Excited atoms (b) Excited molecules
(c) Ground state molecules (d) Ground state atoms
A

---

186. Who postulated the following equation for energy emission when an electron drops from state n_2 to n_1? **[2010**-118 **Eng]**:
(a) Einstein (b) Bohr
(c) Rutherford (d) Heisenberg
B

---

187. For a H-atom which one of the following statements is correct?2008-170 **MEd]**:
(a) the radius of the orbits are integral multiple of the Bohr-radius …. 0.053mm
B

	(b) the angular momentum is n times $\frac{h}{2\pi}$ (c) the energy in the nth- orbit is n times the ground state energy.(d) None of the above		
188.	The total energy of a Hydrogen atom in its ground state is: **[2012**-26 **MEd]**: (a) zero (b) positive (c) negative (d) None	C	
189.	The energy of electron in the excited state n=4 in hydrogen atom is:**[2010**-174 **MEd]**: (a) -13.6eV (b) -3.4eV (c) -0.85eV (d) -1.5eV	C	
190.	The part of electromagnetic spectrum in which Lyman series lies is: **[2012**-110 **MEd]**: (a) Visible region (b) Infrared region (c) Ultra violet region (d) X-rays	C	
191.	Which one of the following series are observed in the visible region of electromagnetic radiation. 2005-01 **MEd]**: (a) Lyman series (b) Balmer series (c) Bracket series (d) Plunds series	B	
192.	Transition from n = 4,5,6…………….. to n = 3 in hydrogen spectrum gives 2007-99 **MEd]** (a) Balmr series (b) Lyman series (c) Paschen series (d) Pfund series	C	
193.	The wave nature of an electron is illustrated by its: **[2011**-103 **MEd]** (a) photoelectric effect (b) Compton effect (c) penetrating effect (d) diffraction	D	
194.	A ball of mass 1 gram is moving with a velocity of $10^3\,m-s^{-1}$. The De-broglie wavel**Eng]**th of the ball is: 2009-172 **MEd]** (a) $13.26\times10^{-36}\,m$ (b) $3.315\times10^{-34}\,m$ (c) $6.63\times10^{-34}\,m$ (d) $4.97\times10^{-36}\,m$	C	
195.	How many different values can m, assume in the electron sub-shell designated by quantum number n=5, 1=4? **[2013**-108 **MEd]** (a) 4 (b) 5 (c) 6 (d) 9	D	
196.	The number of orbital's in 'M' shell of an atom is; **[2010**-29 **MEd]** (a) 1 (b) 4 (c) 5 (d) 9	D	# of orbital in shell = $n^2 = (3)^2$ = 9
197.	If an atom exists in the excited state n = 5, the maximum number of transition takes place is: **[2011**-182 **MEd]** (a) 6 (b) 5 (c) 10 (d) 3	C	# of transition (spectral lines) = $\frac{n(n-1)}{2} = \frac{5(5-1)}{2} = \frac{20}{2} = 10$
198.	An orbital may never be occupied by: 2009-58 **MEd]** (a) 1 electron (b) 2 electrons (c) 3 electrons (d) 0 electron	C	
199.	Nitrogen has three unpaired electrons according to:2009-158 **MEd]** (a) Hund's rule (b) Aulban rule (c) Paoli's exclusion principle (d) Thumb rule	A	
200.	The atomic number of scandium is 21. What is its ground state electronic configuration? **[2012**-08, **Eng]**, **[2013**-92 **MEd]** (a) $1s^2 2N^2 2p^6 3N^2 3p^6 3d^3$ (b) $1s^2 2N^2 2p^6 3N^2 3p^6 3d^3 4s^1$	C	

(c) $1s^2 2N^2 2p^6 3N^2 3p^6 3d^1 4s^2$
(d) $1s^2 2N^2 2p^6 3N^2 3p^6 3d^3 4p^1$

---

201. The correct electronic configuration of Nickel (28) is: **[2012**-118 **MEd]** — A
(a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8\ 4s^2$
(b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^7\ 4s^2\ 4p^1$
(c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^6\ 4s^2\ 4p^2$
(d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^6\ 4s^1\ 4p^3$

---

202. The electronic configuration of gallium, atomic number 31 is: **[2011**-172 **MEd]** — A
(a) $[Ar]4s^2\ 3d^{10}\ 4p^1$ (b) $[Ar]3s^2\ 3d^{10}\ 4p^1$
(c) $[Kr]3s^2\ 3d^{10}\ 4p^1$ (d) $[Kr]4s^2\ 3d^{10}\ 4p^1$

---

203. Which is incorrect about ionization energy? **[2014**-98 **MEd]**: — D
(a) Ionization energy Depends upon the magnitude of nuclear charge.
(b) Ionization energy depends upon the atomic radius
(c) Ionization energy depends upon the shielding effect.
(d) Ionization energy does not depend upon the penetration effect of the inner orbital. .

---

204. Select the incorrect Statement: **[2014**-104 **MEd]** — C
(a) Molecule may gain electron to form molecular anion.
(b) Molecule may lose electron to form molecular cation.
(c) Molecular cations are less abundant than molecular anions.
(d) These molecular ions can be for**MEd]** by passing high energy electron beam through a gas.

---

205. Ruther ford's scattering experiment demonstrate: **[2014**-133 **MEd]** — D
a) The existence of X-rays.
b) The existence of α-particles.
c) The mass to charge ratio of electron.
d) The nuclear model of the atom.

---

206. Which is incorrect statement? **[2014**-143 **MEd]** — C
(a) The ionic bonds are non directional in character.
(b) The crystals of covalent compounds are made up of molecules.
(c) The covalent bonds are regid and non directional.
(d) Ionic compounds have high melting point and boiling point.

---

207. When hydrogen gas is enclosed in a discharge tube using low pressure, it emits: **[2016**-08 **Eng]** — B
(a) Green light (b) Blue light
(c) Red light (d) Yellow light

---

208. Which of the following elements with the given electronic configuration has the highest ionization energy? **[2016**-148 **Eng]** — B
(a) $1S^2\ 2S^2\ 2P^4$ (b) $1S^2\ 2S^2\ 2P^3$
(c) $1S^2\ 2S^2\ 2P^6\ 3S^1$ (d) $1S^2\ 2S^2\ 2P^6\ 3S^2\ 3P^3$

---

209. Shown below are portion of orbital diagrams representing the ground state electronic configuration of certain elements. Which of them obeys the Pauli's exclusion principle? Hund's rules? **[2016**-98 **MEd]** — C
(a) | ↑ | ↑ | ↑↑ | (b) | ↑ | ↑↓ | ↑ |
(c) | ↑ | ↑ | ↑↓ | (d) | ↑ | ↑↑ | ↓ |

---

210. Which of the following electromagnetic waves has the smallest wavel**Eng]**th? **[2016**-158 **MEd]** — C
(a) X-rays (b) Gamma rays
(c) Microwaves (d) Ultraviolet rays

211. Choose atom that is not having a spin quantum number $\frac{1}{2}$. — D
[2016-198 **MEd]**
(a) C^{13} (b) N^{15}
(c) F^{19} (d) O^{16}

---

212. X-rays are widely used as a diagnostic tool in **MEd]**icine because of its: **[2016**-64 **MEd]** — C
(a) Particle property
(b) Cost of X-ray unit is low
(c) High penetrating power
(d) It is not electromagnetic waves

---

213. What are the values of principal quantum number and azimuthal quantum number for the last electron in Chlorine atom? — C
[2016-87 **MEd]**
(a) 1.6 (b) 1.3
(c) 3.1 (d) 6.1

---

214. Choose atom that is not having a spin quantum number $\frac{1}{2}$. — D
[2016-198 **MEd]**
(a) C^{13} (b) N^{15}
(c) F^{19} (d) O^{16}

CHAPTER-3: THEORIES OF COVALENT & SHAPES OF MOLECULES

215. The bond energy of H_2 molecule ($H_2 \rightarrow 2H$) is: 2017-21 Med — D
A) 436 Kj/mol B) 40.7 Kj/mol
C) 272 kj/mol D) 436 Avogadro's no Kj/mol
Text Book Reference: Page #91(Ch#03, 1st Year)

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216. Condidering the molecular orbital theory (MOT) choose the correct relative energies order: 2017-22 — A
a) σ15 < σ*15<σ25< σ*25<σ2Px<π2Pz=πzPz
b) σ15 < σ*15<σ25< σ*25<π2Py=π2Pz<π2Pzx
c) σ15 < σ*15<σ25< σ*25<π2Px=π2px<σ2Py
d) σ15 < σ*15<σ25< σ*25<π2py<π2pz<π2px

---

217. The existence of H is not possible because: 2017-140 Med — D
A. It would be disproportion
B. It would ratio active
C. It violate the pauli exclusion principle
D. No H-H bond would form

---

218. Silver mirror is given by: 2017-17 Eng — A
A. Aldehyde B. Ketone
C. Ethers D. Acids

---

219. Select the one having half-filled P Orbitals on losing an electron: 2017-72 Eng — C
A Nitrogen B.Lithium
C.Oxygen D.Fluorine

---

220. Which of the following ions contain one unpaired electron? 2018-47 Eng — C
A)Zn^{+2} B)K^{+1}
C)Cu^{+2} D)Na^{+1}

---

221. According to VSEPR theory, in which of the following molecules the electron pair geometry is;2018- Eng — B
A)CH_4 B)NH_3
C)BF_3 D)None of the above

222. The orbital with highest energy is — C
A)Hybrid B)Un-hybrid
C)Molecular d) all are of equal energy

---

223. The unpaired electron in the molecule of NH_3 is: 2018-eng — A
A) 0 b) 1
c) 2 d)3

---

224. Unhybrid "P" orbitals on linear overlap: 2018-med — C
A) Always form Pi(n) bond
B) Always form Sigma(σ) bond
C) Neither form "a" nor "" bond
D) Form more reactive and more unstable "π" bond

---

225. Specie with dipole moment equal to zero is: 2018-Med. — d
A) CO_2
B)CH_4
C)1-4-Dibromobenzene
D) all of the above

---

226. In the compound CO_2, and $_{H20}$ the hybridization in oxygen is respectively; 2018- Med — B
A) Sp^2 and Sp^3 B)Sp^2 and Sp^3
C)Sp^3 and Sp^3 D)Sp^3 and Sp^2

---

227. Select molecule that has unpaired electrons in anti-bonding molecular orbitals: **[2015**-05 **MEd]** — D
A) N_2 B) Cl_2
C) H_2 D) O_2

---

228. Choose the type of hybridization of carbon atoms in cyclopropane and the bond angle C– C–C. **[2015**-45 **MEd]** — B
A) Sp^3, 109.5 ° B) Sp^3, 60 °
C) Sp^2, 120 ° D) Sp^2, 107 °

---

229. The shape of $SnCl_2$ is: **[2015**-74 **MEd]** — D
A) Linear B) Trigonal pyramidal
C) Trigonal planar D) Angular

---

230. What happens to the molecule when its atoms are brought closer than the bond l**Eng]**th between them? 2005-12 **MEd]** — A
(a) Molecule becomes unstable
(b) Molecule becomes more stable
(c) Molecule starts vibrating
(d) Stability of the molecule remains un-changed

---

231. What causes a sharp increase in the energy with a further decrease in the distance between atomsA and B after bond formation? **[2010**-158 **Eng]** — B
(a) Attraction of atoms A and B
(b) Repulsion of nuclel of A and B and electrons of A and B
(c) Attraction of nucleus of A and electron of B
(d) Bond formation

---

232. During the formation of a chemical bond between two atoms the forces which are operative are: **[2010**-42 **Eng]** — A
(a) Both forces of attraction and repulsion
(b) Either force of attraction nor repulsion
(c) Only force of attraction
(d) Only force of repulsion

233. Which of the following elements with a given electronic configuration has the highest ionization potential value? **[2012**-134 **MEd]** — A
(a) $1s^2\ 2s^2\ 2p^3$ (b) $1s^2\ 2s^2\ 2p^4$
(c) $1s^2\ 2s^2\ 2p^6\ 3s^1$ (d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$

234. Which one will show ionic bonding? **[2012**-04 **MEd]** — A
(a) NaH (b) $PbCl_4$
(c)HCl (gas) (d)PCl_3

235. The longest bond is of: 2008-175 **MEd]** — A — Electronegative difference $\propto \frac{1}{bond\ length}$
(a) H – 1 (b) H – O
(c) H – S (d) H – Cl

236. Which one of the following compounds has the shortest carbon-halogen bond? **[2013**-190 **Eng]** — A
(a) CH3F (b) CH_3CI
(c) CH_3Br (d) CH_3I

237. CO_2 is ISO-structural with: 2009-125 **MEd]** — A
(a) $HgCl_2$ (b) $SnCl_2$
(c) C_2H_2 (d) NO_2

238. Oxygen molecule has two unpaired electrons. It is therefore, **[2013**-132 **MEd]** — D
(a) Ferromagnetic (b) Diamagnetic
(c) Electromagnetic (d) Paramagnetic

239. Which of the following hybridization can explain the shape of $BeCl_2$? **[2012**-138 **MEd]** — B
(a) sp^2 hybridization (b) sp hybridization
(c) sp^3 hybridization (d) dsp^2 hybridization

240. Which of the following pairs of molecules have similar geometry? 2005-51**MEd]** — D
(a) CO_2 and SO_2 (b) BF_3 and NH_3
(c) $MgCl_2$ and AlCl (d) CH_4 and SiH_4

241. How many sigma bonds are there in $CH_2 = CH–CH = CH_2$: **[2012**-99 **MEd]** — B
(a) 6 (b) 9
(c)11 (d)4

242. The bond angle between H - C – C bond in ethane is: **[2013**-52 **MEd]** — A
(a) 109.5 (b) 120
(c) 90 (d) 107.5

243. What type of hybrid orbits are used by the carbon atoms in C_2H_4? 2005-168 **MEd]** — B
(a) sp (b) sp^2
(c) d^2sp^2 (b) sp^3

244. Species in which the central atom uses Sp hybride orbital in its bonding is: 2009-148 **MEd]**
(a) PH_3 (b) NH_3
(c) SbH_3 (d) C_2H_2

245. The bond form between boron and Hydrogen is: **[2010**-165 **MEd]**
(a) Ionic (b) Covalent
(c) Coordinate covalent (d) None of the above

246. The behavior of $PbCl_2$ and $PbCl_4$ respectively are: **[2011**-13 **MEd]** A
(a) Ionic and covalent
(b) Covalent and ionic
(c) Covalent and coordinate covalent
(d) Ionic and coordinate covalent

247. What type(s) of bonds is/are present in NH_4Cl? 2008-163 **MEd]** D
(a) Ionic (b) Covalent
(c) Co-ordinate covalent (d) All of them

248. In which compound the bond angle is maximum? **[2014**-144 **MEd]** B
a) Methane b) Beryllium chloride
c) Ammonia d) Boron trifluoride

249. London forces are stronger in: **[2015**-33 **MEd]** B
A) Br_2 B) I_2
C) F_2 D) Cl_2

250. What is true about modern methods used in the determination of the structure of compounds? **[2015**-146 **MEd]** D
A) Accurate but more time consuming
B) Accurate, rapid but chemicals are used in large amounts
C)Accurate, rapid but sophisticated and complicated
D) Accurate, simple and less time consuming

251. Bond energy of covalent bond decreases with the increase in: **[2016**-88 **Eng]**s C
a) Polarity (b) Multiplicity
(c) Size of atom (d) All of the above

252. In the compound $^4CH_2 = {}^3CH - {}^2CH = {}^1CH_2$ **[2016-99 Eng]** C
(a) C-1 and C-2 are SP2 hybridized
(b) C-1 and C-2 are SP hybridized and C-2 and C-3 are SP2 hybridized
(c) All the carbon atoms are SP2 hybridized
(d) All the statements are wrong

CHAPTER-4:-GASES

253. When an electric current is passes through neon gas, it produces: 2018-35 Eng C
A)Plasma B)Light
C)Both plasma and light d) plasma,light,sound

254. The collision of the gas molecules with the wall of the container is responsible for gaseous pressure. According to van der walls (after pressure correction) which gas will exert more pressure if temperature is kept constant: 2018101 Eng D
A)Real gas B)ideal gas
C)Non ideal gas D)All exert same pressure

255. Atmospheric pressure is measured by: 2018-88 Eng B
A)Hygrometer B)Barometer
C0pyrometer D)Spherometer

256. Regarding liquefaction of gases, the highest temperature at a fixed pressure of; 2018155 Eng A
A)SO_3 B)NH_3
c) CL_2 D)CO_2

257. The equation used to describe the behavior of ideal gases under standard conditions; 2018-73 Med,Paper-D D
A)PV=nRT b)PM=dRT
c) PVM=mRT`D)All of the above

258.	An unknown gas diffuses 5 times slower than that of H_2 The molecular mass of the unknown gas is; 2018192 Med,Paper-D A)50 b)10 c)15 D)25.	A	
259.	At constant temperature if the pressure of the gas is doubled its volume becomes. **[2010**-46 **Eng]** (a) One half (b) Double (c) Four times (d) Remains the same	A	
260.	According to Gay-Lusac's variation of the volume of a sample of gas, at constant pressure a straight line was obtained where slope was found to be equal to: **[2012**-01 **Eng]** (a) $\frac{v_1}{273}$ (b) $\frac{v_0}{273}$ (c) $\frac{P_1}{273}$ (d) $\frac{P_0}{273}$	B	
261.	If absolute temperature of the gas is doubled and pressure is increased 4 times, then the volume becomes: **[2015**-96 **MEd]** A) Half B) Double C) 4 times D) Unchanged	A	T∝V & P∝1/V
262.	At what temperature both Fahrenheit and Celsius scales coincide? **[2010**-34 **Eng]** (a) 40^0C (b) -30^0C (c) 32^0C (d) -40^0C	D	
263.	Which thermodynamic temperature is equivalent to 501.85^0C?**[2013**-123 **MEd]** (a) 775.00 K (b) 774.85 K (c) 228.85 K (d) 228.70 K	A	= C^0 + 273.15 K = 501.85 C^0 + 273.15 = 775.00K
264.	Which scientist made the following proposal equal volumes of gases under the same conditions of temperature and pressure containthe same number of particles **[2010**-119 **Eng]** (a) Gay lussac (b) Curie (c) Dalton (d) None of the above	c	
265.	At constant temperature, if the volume of the given mass of a gas is doubled, then the bdensity of the gas becomes. **[2011**-92, 2007-37 **MEd]**: (a) Double (b) One half (c) One quarter (d) Four times	B	
266.	In a closed room of $1000m^3$, a perfume bottle is opened up. The room develops smell. This is due to which property of gases?2007-63 **MEd]** (a) Diffusion (b) Viscosity (c) Density (d) None of the above	A	
267.	A bottle of dry HN_3 and a bottle of dry HCl connected through a long tube are opened simultaneously at both ends. The white NH_4Cl ring for**MEd]** will be 2007-89 **MEd]** (a) At the centre of the tube (b) Near the NH_3 bottle (c) Near the HCl bottle (d) Throughout the l**Eng]**th of the tube	A	Because NH_3 is lighter than HCl and will travel more distance.
268.	Rate of diffusion on NH_3 is 1.6 times faster than CO_2. The correct form of the rate law equation for this statement will be 2005-16 **MEd]** (a) $\frac{rNH_3}{rCO_2}=\frac{1}{1.6}$ (b) $\frac{rNH_3}{rCO_2}=\frac{1.6}{1}$	B	

(c) $\frac{rCO_2}{rNH_3} = \frac{1}{1.6}$ (d) None of these

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269. If a single balloon is filled with equal volumes of hydrogen, helium, nitrogen, and neon, which gas will be depleted first?
2007-23 **MEd]**
(a) Helium (b) Hydrogen
(c) Nitrogen (d) Neon

Answer: B

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270. Consider an equation: $N_2 + O_2 \rightarrow 2NO$. The partial pressure (In atm) of N_2 under normal atmospheric pressure is: 2006-17 **MEd]**
(a) 0.05 (b) 0.25
(c) 0.35 (d) 0.45

Answer: D

P = XP_0
(n = 2 moles)
P^0 = Total Pressure=1atm
X = Mole fraction = $\frac{Moles\ of\ Comp}{Total\ Moles\ in\ Mix} = \frac{1}{2} =$ 0.5
$P = X P_0 = 0.5 \times 1 = 0.5$ atm
Partial Pressure of N_2= 0.45

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271. A mixture of 50g H_2 and 50g He has a total pressure of 1.5atm. what is the partial pressure of H_2 gas 2005-54 **MEd]**
(a) 1.0atm (b) 2.0atm
(c) 1.5atm (d) 3.0atm

Answer: A

$P = X P^0$

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272. 4.0 dm^3 of O_2 at a pressure 800 atm and 1.0 dm^3 of N_2 at a pressure of 100 atm are put into a 2.0 dm^3 vessel. The total pressure in the vessel is: 2008-15 **Eng]**
(a) 800atm (b) 600 atm
(c) 900 atm (d) 200 atm

Answer: C

$P_{Total} = P_1 + P_2 =$ 800 + 100 = 900 atm

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273. Why does an ideal gas exert pressure on its container? **[2012**-62 **Eng]**
(a) The molecules of the gas collide continually with each other.
(b) The molecules of the gas collide in elastically with the walls of the container.
(c) The molecules of the gas collide continually with the walls of the container.
(d) The weight of the molecules exerts a force on the walls of the container.

Answer: b

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274. 40.0 dm^3 of an ideal gas at 25^0C and 750 mm Hg is expanded to 50.0 dm^3. The pressure of the gas changed to 765 mm Hg. What is the temperature of the gas? **[2013**-98 **MEd]**
(a) $\frac{(2912)(750)(50)}{(40)(765)}$ (b) $\frac{(298)(750)(40)}{(50)(765)}$
(c) $\frac{(2912)(765)(50)}{(750)(40)}$ (d) $\frac{(750)(40)}{(298)(765)(50)}$

Answer: C

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$
$T_2 = \frac{P_1V_1T_1}{T_1V_1} = \frac{(765)(50)(298)}{(750)(40)}$

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275. The ideal gas equation is PV = nRT the symbol n in SI unit represents: 2008-180 **MEd]**
(a) The number of molecules in the gas
(b) Avogadro's number
(c) The number of kilo-moles
(d) The number of molecules per unit volume

Answer: A

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276. The volume occupied by 3.2 g of oxygen at STP is: **[2012**-131 **MEd]**
(a) 22.4 dm^3 (b) 2.24 dm^3
(c) 11.2 dm^3 (d) 16.0 dm^3

Answer: B

$n = \frac{m}{M} = \frac{3.2}{32} = 0.1$ & $n = \frac{V}{Vm} \Rightarrow V = n \times V_m = 0.1 \times 22.4 = 2.24$

277.	The internal energy of fixed cases of an ideal gas depends on: **[2013**-116 **MEd]** (a) Pressure, but not volume or temperature. (b) Temperature, but not pressure or volume. (c) Volume, but not pressure or temperature. (d) Pressure and temperature, but not volume.	B
278.	Which one of the following most closely resembles an ideal gas? **[2011**-159 **MEd]** (a) Xe (b) H_2 (c) CO_2 (d) He	D
279.	Real gases deviate more from ideal behavior at: 2009-98 **MEd]** (a) High temperature only (b) High pressure only (c) High pressure and low temperature (d) Low pressure and high temperature	c
280.	Which gas deviates most from ideal behavior at room temperature and pressure? 2005-133 **MEd]** (a) Hydrogen (b) Nitrogen (c) Methane (d) Sulphur dioxide	D Deviation ∝Polarity
281.	Equal vlume of different gases under same condition of temperature and pressure contain the same number of particles. The above statement is of: **[2014**-80 **MEd]**: (a) Avogadro's law (b) Graham's Law (c) Dalton's law (d) Hund's rule	A
282.	The van der waals equation of state for no-ideal gases differs from the ideal gas law in that it accounts for: **[2014**-131 **MEd]**: I) The mass of each molecule of the gas. II) The volume of each molecule of the gas. III) The attractive forces between molecules of the gas. (a) I , II and III (b) I and II only (c) I and III only (d) II and III only	D
283.	Equal volume of CO and N_2 are taken in identical conditions, the correct relation between masses of two gases is: **[2015**-08 **Eng]** A) $CO < N_2$ B) $CO > N_2$ C) $CO = N_2$ D) $N_2 < CO$	C
284.	A flask contain 6 gram of hydrogen gas and 64 gram oxygen at r.t.p the partial pressure of hydrogen gas in the flask of the total pressure (p) will be: **[2016**-178 **Eng]**s (a) 2/3 p(b) 3/5 p (c) 2/5 p(d) 1/3 p	B
285.	A gas diffuses ½ times as fast as hydrogen gas its molecular mass is: **[2016**-187 **Eng]** (a) 32 a.m.u (b) 25 a.m.u (c) 8 a.m.u (d) 16 a.m.u	C
286.	At absolute zero the molecules of hydrogen gas will have: (a) Only translational motion (b) Only vibrational motion (c) Only rotational motion (d) All the motion are ceased	B
287.	If p is a pressure and δis a density then p/δha units of: **[2016**-169 **MEd]**s (a) m^2/s^2 (b) N/m^2 (c) Kg/m^2 (d) m^3/Kg	A

288. At absolute zero the molecules of hydrogen gas will have: B
[2016-19 **MEd]**
(a) Only translational motion
(b) Only vibrational motion
(c) Only rotational motion
(d) All the motion are ceased

Chapter-5+6:-LIQUIDS & SOLIDS

289. The compound with most exothermic lattice energy is: 2017-81 Med **C**
A. $CaCl_2$ B. K_2O
C.CaO D.$BaCl_2$

290. Choose the anisotropic behavior; 2017141 Med **A**
A. Coefficient of thermal expansion
B. Lattice energy
C. Viscosity
D. Infrared spectroscopy

291. Amorphous solids are made by fusing silicates with: 2017-93 Med **D**
A. Boric acid
B. Aluminum oxide
C. Phosphorus pentoxide
D. All of the above

292. Compound with a greater number of hydrogen bonding is: 2018-81 Eng **B**
A)CH_3OH B)H_20
C)CdS D)H_2SO_4

293. The liquid with highest rate of evaporation among the following is: 2018-82 Eng **B**
A)Water B)Ethyl alcohol
C)Ammonia D)N-pentane

294. All are anisotropic at room temperature except; 2018126 Eng **A**
A)CCL_4 B)$AgNO_3$
C)CdS D) $BaCO_3$

295. At a temperature of-10 °C which one doesn't be have the property of molecular crystal among the following is: 2018157 Eng **D**
A) Phosphorous
B) Water
C) Sucrose
D) None of the above

296. Evaporation depends upon' 2018119 Med Paper-D **D**
A) Surface area B)Temperature
C)Both (A) & (B) D)None of the above

297. Hydrogen bonding in H-F is stronger than H_20 and NH_3. The highest boiling point among the three; 2018193 Med,Paper-D **C**
A)HF B)NH_3
C)H_2O D)All have equal boiling points.

298. In which of the following compounds hydrogen bonding is possible? **C**
[2012-166 **MEd]**
(a) PH_3 (b) CH_4
(c) NH_3 (d) SiH_4

299.	Cleaning action of soap is due to: 2009-112 **MEd]** (a) Decrease in surface tension of water (b) Viscosity of water (c) High boiling point of water (d) Polarity of water	**A**	
300.	What type of intermolecular attractive force are present in CO_2?2008-64 **MEd]** (a) Hydrogen bonding (b) Dipole-dipole interaction (c) London forces (d) Covalent bounding	**C**	
301.	Which is true about London forces? **[2012**-115 **MEd]** (a)London forces are present in non-polar molecules(b) London forces are present in polar molecules (c) London forces are created between instantaneous dipole and induced dipole (d) All of the above.		
302.	London dispersion forces (forces between the particles) are present in: 2008-185 **MEd]** (a) Gases only (b) Liquids only (c) Solids only (d) All of the above	**D**	
303.	Evaporation occurs at: **[2010**-56**Eng]** (a) All (b) Low temperature (c) High temperature (d) Absolute temperature	**A**	
304.	The lowest vapor pressure is exerted by. 2006-114 **MEd]** (a) Water (b) Kerosene oil (c) Mercury (d) Rectified spirit	**C**	
305.	Choose the correct statement: **[2012**-21 **Eng]**: (a) crystalline solids are usually anisotropic but liquid crystals are isotropic. (b) crystalline solids are usually isotropic but liquid crystals are anisotropic. (c) liquid crystals have both isotropic and 25anisotropic properties (d) liquid crystals are devoid of isotropic and anisotropic properties.	**A**	
306.	The shape or appearance in which a crystal grows is called: 2009-145 **MEd]** (a) Crystal geometry (b) Crystal lattice (c) Crystal habit (d) None of the above		
307.	The existence if a substance in more than one solid modification is know as. 2007-122 **MEd]** (a) Isomorphism (b) Amporphism (c) Polymorphism (d) None of the above	**C**	
308.	KNO_3 exists in two crystalline forms Rhombohedra and orthombic the phenomenon is known as: **[2011**-158 **Eng]**: (a) Polymorphism (b) Isomorphism (c) Allotropy (d) None of these	**A**	
309.	Choose the correct statement: **[2012**-122 **MEd]**: (a) Ionic solids exist in the form of molecules (b) Ionic solids have high volatility (c) Ionic solids exist in the form of liquids and (d) Ionic solids have high melting points and boiling points	**D**	Ionic solid never exists in the form of liquids or gases
310.	Which one of the following characteristics is not usually attributed to Ionic substances? **[2010**-159 **MEd]**	**c**	

(a) High melting point (b) Deform when struck (c) Fragility (d) Crystalline

No.	Question	Ans	Explanation
311.	The electrical conductivity of NaCl crystal is: 2008-159 **MEd]** (a) More than NaBr crystal (b) Les than NaBr crystal (c) Equal to NaBr crystal (d) NaCl crystal doesn't conduct electric current	**d**	
312.	The type of intermolecular forces (force between the particles) present in solid mercury is: 2008-118 **MEd]**: (a) covalent bonds (b) Ionic Bonds (c) Metallic bonds (d) H-bonds	**c**	
313.	Both $NaNO_3$ an $CaCO_3$ crystallize in Rhombohedral forms therefore they are: **[2014-65 MEd]**: (a) Allotropes (b) Polymorphous (c) Isomorphous (d) None of these	**D**	**Different crystalline solids having same crystal shape are called isomorphs.**
314.	Pure water freezes at 0 °C and boils at 100 °C at standard conditions. Calcium chloride was added to pure watr. What dou you expect about its freezing point and boiling point. **[2014-66 MEd]**: (a) No change in its freezing point and boiling point (b) Freezing point increases and boiling point decreases. (c) Freezing point increases and boiling point increases (d) Freezing point decreases and boiling point increases	**D**	
315.	Hydrogen bonding do not exist in the molecule of: **[2014-91 MEd]**: (a) Hydrogen (b) Proteins (c) Carbohydrates (d) Ammonia		
316.	Vapour pressure of a liquid can be measured by the Barometric method and Manometric: **[2014-97 MEd]**: (a)Barometric method is more accurate than Manometric method. (b)Manometric method is more accurate than Barometric method. (c)Both are equally accurate and applicable. (d)Both methods are in use but are not reliable.		
317.	Liquid crystelline substances are used to locate tumors in the body because: **[2014-119 MEd]**: (a)These parts of the body are warmer than the surroundings. (b)These parts of the body are cooler than the surroundings. (c)These parts of the body are constantly increasing and decreasing with the temperature. (d)None of the above		
318.	Sodium chloride crystal structure is:**[2014-161 MEd]**: (a) Hexagonal (b) Body centered cubic (c) Face centered cubic (d) Tetragonal		
319.	Choose the compound in whichh hydrogen bonding is not possible: **[2014-176 MEd]**: (a) H_2O (b) HCl (c) CH_3COOH (d) CH_3OCH_3		**Compounds having F,O & N atoms can form hydrogen bonding.**

320. Atomic size of xenon is larger than Neon. Considering the London dispersion forces which one of the following is true.
[2016-68 **Eng]**
(a) Neon molecules have weaker London dispersion forces
(b) Xenon molecules have weaker London dispersion forces
(c) Xenon and Neon have almost same London dispersion forces
(d) Xenon have lower boiling point than neon

A

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321. The heat of vaporization of the liquid A, B and C are 60, 30 and 40 recall/mule respectively the order of decreasing inter molecular forces among their molecules is: **[2016**-158 **Eng]**s
(a) A>B>C (b) C>B>A
(c) A>C>B (d) B>C>A

C

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322. Graphite is one of the allotropic form of Carbon it is:
[2016-119 **MEd]**
(a) Isotropic (b) Anisotropic
(c) Bond conductor of electricity (d) Both (b) & (c)

B

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323. Distillation under reduced pressure is used to purify liquids which
2007**MEd]**
(a) Are explosive
(b) Are highly volatile
(c) Decompose at their boiling point
(d) Have high boiling point

D

vacuum ditillation decrease the time of distillation and also avoid thermal decompositions of many compounds like glycerine.

CHAPTER-7 CHEMICAL EQUILIBRIUM

324. The specie with a strongest conjugate base in aqueous solution among the following; 2018-196 Eng
A) HI
B) HNO_3
C) CH_3COOH
D) $HClO_4$

C

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325. Excess of $BaSO_4$ was dissolved in pure water at 25^0C. If its Ksp = 1×10^{-10} what is the Conc: of Ba^{2+} ions in water?
[2016-200 **MEd]**
(a) 10^{-10} (b) 10^{-20}
(c) 10^{-5} (d) 10^{-6}

C

As Ksp value is duw to product of B and SO_4 so concentration of Ba^{+2} is :
Ksp = $[Ba][SO_4] = 10^{-14}$
Ksp = $[10^{-5}][10^{-5}] = 10^{-14}$
$Ba^{+2} = 10^{-5}$

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326. $NH_4OH_{(aq)} \leftrightharpoons NH_4^+(aq) + OH^-_{(aq)}$
.Consider the above ionization, Ammonium chloride is added to the system. Select the correct statement.
[2015-04 **MEd]**
A) The equilibrium will shift to the right
B) The equilibrium will shift to the left
C) The equilibrium will remain undisturbed
D) The equilibrium will be attained quickly

B

The equilibrium will shift towards left because NH_4OH is suppressed by ammonium chloride due to common ion effect.

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327. When does a chemical reaction attain equilibrium?
2009-22 **MEd]**
(a) When forward and backward reaction taking place at the same rate
(b) reaction takes place
(c) The forward and backward
(d) There are two reactions with one faster than the other

A

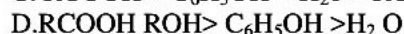
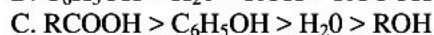
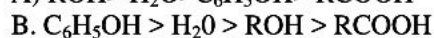
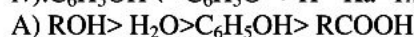
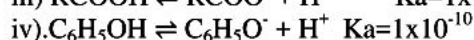
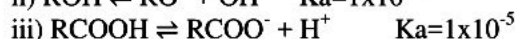
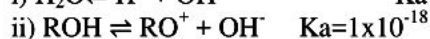
When forward and backward reaction taking place at the same rate, the equilibrium is established.

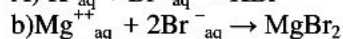
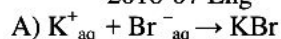
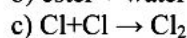
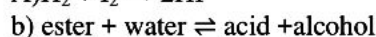
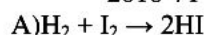
No.	Question	Ans	Explanation
328.	For a reversible reaction to reach on equilibrium state the reaction said to be carried out in: 2006-149 **MEd]** (a) Glass vessel (b) Iron vessel (c) Open vessel (d) closed vessel	D	For reaction to reach in equilibrium, reaction must carried out in closed vessel so no product or reactant can leave the vessel and equilibrium can be established.
329.	Forces controlling the reactions are proportional to the product of the active masses (concentration) of chemicals. The above statement is of: **[2012 MEd]** (a) Raoult's Law (b)Le Chatlier's principle (c) The law of conservation of energy (d)The law of mass action	D	Law of mass action states that Forces controlling the reactions are proportional to the product of the active masses (concentration) of chemicals.
330.	Select the correct equilibrium constant expression, Kc for the following reversible reaction. **[2012**-122 **MEd]** $Ce^{4+}_{(aq)} + Fe^{2+}_{(aq)} \rightleftharpoons Ce^{3+}_{(aq)} + Fe^{3+}_{(aq)}$ (a) $\frac{[Ce^{3+}_{(aq)}][Fe^{3+}_{(aq)}]^2}{[Ce^{4+}_{(aq)}][Fe^{2+}_{(aq)}]}$ (b) $\frac{[Ce^{3+}_{(aq)}][Fe^{3+}_{(aq)}]}{[Ce^{4+}_{(aq)}][Fe^{2+}_{(aq)}]}$ (c) $\frac{[Ce^{3+}_{(aq)}]^2[Fe^{3+}_{(aq)}]}{[Ce^{4+}_{(aq)}][Fe^{2+}_{(aq)}]}$ (d) $\frac{[Ce^{3+}_{(aq)}][Fe^{3+}_{(aq)}]}{[Ce^{4+}_{(aq)}]^2[Fe^{2+}_{(aq)}]}$ **Answer:**	B	Kc = product/reactant= $\frac{[Ce^{3+}_{(aq)}][Fe^{3+}_{(aq)}]}{[Ce^{4+}_{(aq)}][Fe^{2+}_{(aq)}]}$
331.	A reaction between CO and H2O is: $CO_{(g)} + H_2O \rightleftharpoons CO_2(g)+H2$ the unit of equilibrium for this reaction is:**[2010**-92 **Eng]** (a) Mol/liter (b) Liter/mol (c) Dimensionless (d) Mol/cm^3	C	The reaction has not unit and dimensionless because 2 mol reactants gives 2 mol products.
332.	If Kc is small, it indicates that the equilibrium occurs 2007-20 **MEd]** (a) At a low product concentration (b) Only with the help of catalyst (c) At a high product concentration (d) None of these	A	Kc=pro/reactant If Kc is small, it means product is less.
333.	Considera chemical reaction $2Cl(g) \rightleftharpoons Cl_2(g)$ The extent of completing this reaction depends upon the magnitude of kc and shows that the equilibrium mixture will consist almost of Cl molecules when. **[2010**-156 **MEd]** (a) Kc is very large (b) Kc is very small (c) Kc is netiher very small nor very large (d) Kc is equal to 1	A	As mixture contains mostly molecules that I Cl_3 which is product in this case. Kc=product/reactant As product is more so Kc value is very large.
334.	If Kc of a certain reaction is large it indicates that at equilibrium: **[2012**-114 **Eng]** (a) The reactants concentration will be high (b) the products concentration will be low (c) The products concentration will be high (d) the reactants and products concentration will be equal	C	If Kc value is large, it means products are large or in high amount. Because Kc=productreactant
335.	The equilibrium constant for a reaction. N_2 (g) + O_2 ⇌ (g) 2NO (g) is 4x 10^{-4} at 2000k. in the presence of catalyst the equilibrium is attained 10 times faster. The equilibrium constant in presence of catalyst at 2000 k	B	

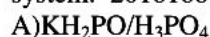
is. 2007-111 **MEd]**
(a) 10 x 10^{-4} (b) 4 x 10^{-4}
(c) 40 x 10^{-4} (d) 4 x 10^{-2}

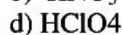
No.	Question	Ans	Explanation
336.	Consider the reaction $3H_2(g) + N_2(g) \rightarrow 2NH_3(g)$ All of the following will lead in this reaction to the production of more NH_3 except 2005-19 **MEd]** (a) A decrease in the volume of the container (b) An increase in pressure by addition of hydrogen (c) Removal of NH_3 (d) An increase in pressure by addition of nitrogen	A	If we increase the pressure the reaction move in forward direction, also by removing ammonia reaction will move in forward direction. If we decreases the container volume it will effect reaction rate because reactants will not react easily.
337.	$H_2 + I_2 \rightleftharpoons 2H_2$ this reaction is not effected by: 2007-39 **MEd]** (a) Volume (b) Pressure (c)Temperature (d)PH	B	$H_2 + I_2 \rightleftharpoons 2H_2$ this reaction is not effected by pressure because two moles of reactants gives two moles of products.
338.	For reaction $3O_{2(e)} \rightleftharpoons 2O_{3(e)}$ Kc = 10^{-56} at 25^0C one can predict 2008-198 **MEd]** (a)More O_3 is formed (b) more reactants are consumed (c)The forward reaction progresses to a large extent (d)The backward reaction goes to near completion.	D	As value of Kc is very small, so only little products is present, it means the backward reaction in near to complete.
339.	Reactant formation in an endothermic reaction would be favoured by which of the following? **[2010**-84 **MEd]** (a) Increase in temperature (b) Decrease in temperature (c) No change in temperature (d) First increase and then decrease in temperature **Answer:**	B	If reaction is endothermic, it means that It required heat to form product and its backward direction is exothermic. Decrease in temperature will favor backward direction and will form reactants.
340.	Consider the reaction $2SO_2 + O_2 \rightarrow 2SO_3$ The yield of SO_3 will be maximum if: 2008-102 **MEd]** (a) Both pressure & temperature are increase (b) Both pressure and temperature are decrease (c) Temperature is decreased and pressure is increased. (d) Temperature is increased and pressure is decreased	C	To get more product in this case , we should decrease the temperature because the reaction is exothermic and evolve heat. Also the increase in pressure gives more product because volume is decreased in forward direction. 3 moles reactants gives 2 moles product.
341.	The value of K (equilibrium constant) for a reaction? 2009-28 **MEd]** (a) Is the same at different temperatures? (b) Is different, at different temperature (c) Is negligible at room temperature. (d) Can be the same at different temperatures	B	The value of Kc is different for different temperature because it is effected by temperature.
342.	Consider the following endothermic reaction: $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$ What will happen to the equilibrium if the temperature of the system is raised? **[2012**-64 **MEd]** (a) The equilibrium will shift in the backward (b) The equilibrium position will suffer no change (c) The equilibrium will shift to forward direction (d) All of the above	C	Formation of NO is endothermic process, so increase in temperature will favor forward direction of reaction.

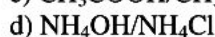
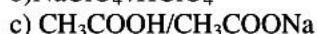
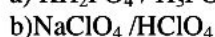
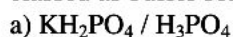
No.	Question	Ans	Explanation
343.	For the exothermic reaction, forward reaction is $NO_{(8)} \rightleftharpoons N_{2(8)}+O_{2(8)}$ **[2010-49 MEd]** (a) Is independent of temperature (b) Increases as temperature increases (c) Decreases as temperature increases (d) Varies with addition of N_2 and O_2	C	The forward reaction is exothermic so it will decrease as the temperature increases.
344.	Consider the reaction $2SO_2 + O_2 \rightarrow 2SO_3$ The yield of SO_3 will be maximum if: 2012-02 **MEd]** (a) both pressure & temperature are increase (b) both pressure and temperature are decrease (c) temperature is decreased and pressure is increased (d) Temperature is increased and pressure is decreased	C	To get more product in this case , we should decrease the temperature because the reaction is exothermic and evolve heat. Also the increase in pressure gives more product because volume is decreased in forward direction. 3 moles reactants gives 2 moles product.
345.	In the given Exothermic reaction $PCl_3+Cl_2(g) \rightarrow PCl_5(g)$ an increase in yield will be favored by: 2005-102 **MEd]** (a) Decrease of temperature (b) Increase of temperature (c) Keeping temperature constant (d) None of these	A	An increase in yield will be favored by decrease inn temperature because forward reaction is already exothermic.
346.	The values of ionic product kw are $0.64x10^{-14}$ at 18^0c, $1x10^{-14}$ at 25^0c. form this may be derived that **[2010-100 MEd]** (a) Endothermic process (b) Exothermic process (c) Vaporization process (d) Change of H_2O into O_2 and H_2	C	
347.	Which is not correct about the manufacture of ammonia by Haber – Process? The break opening of the nitrogen triple bond $(N \equiv N)$ to form N_2H_2 in first step of the reaction is taken as; **[2012-131 Eng]** (a) Very difficult step (b) Highly unstable product (c) Highly endothermic (d) None of the above	C	The break opening of the nitrogen triple bond $(N \equiv N)$ to form N_2H_2 in first step of the reaction is taken as highly endothermic because it involves breaking of triple bonds.
348.	$K_p = K_c (RT)^{\Delta n}$ in the equation if $\Delta n < 0$ then: **[2016-88 MEd]** (a) $K_p = K_e$ (b) $K_p<K_c$ (c) $K_p>K_c$ (d) $K_p< 0$	B	$K_p = K_c (RT)^{\Delta n}$ in the equation if $\Delta n < 0$ then $K_p = K_c (RT)^{-\Delta n}$ $K_p = K_c /(RT)^{\Delta n}$ it means that when we divide Kc by values of $RT^{\Delta n}$ value then it equals to K_p otherwise it is higher than k_p.
349.	Which is not correct about the manufacture of ammonia by Haber – Process? The break opening of the nitrogen triple bond $(N \equiv N)$ to form N_2H_2 in first step of the reaction is taken as: **[2016-13 MEd]** (a) Very difficult step (b) Highly unstable product (c) Highly endothermic (d) None of the above	c	The break opening of the nitrogen triple bond $(N \equiv N)$ to form N_2H_2 in first step of the reaction is taken as highly endothermic because it involves breaking of triple bonds.
350.	Choose acids that are showing leveling effect; 2017-35 i) $HClO_4$ ii)HI iii) HCI iv) HF A. I & iv B.i, ii,& iv C. iii & iv D. i, ii,& ii	D	
351.	Ka values of some compound are given below, select the correct order of acidic strength: 2017121	C	

Med
i) $H_2O \rightleftharpoons H^+ + OH^-$ Ka=1x10^{-14}
ii) $ROH \rightleftharpoons RO^+ + OH^-$ Ka=1x10^{-18}
iii) $RCOOH \rightleftharpoons RCOO^- + H^+$ Ka=1x10^{-5}
iv).$C_6H_5OH \rightleftharpoons C_6H_5O^- + H^+$ Ka=1x10^{-10}
A) ROH> H_2O>C_6H_5OH> RCOOH
B. C_6H_5OH > H_20 > ROH > RCOOH
C. RCOOH > C_6H_5OH > H_20 > ROH
D.RCOOH ROH> C_6H_5OH >H_2 O

352. Excess of Ag_2CrO_4 was dissolved in distilled water its solubility was found to be 1.3x10^{-4} mol dm^{-3}. What is the solubility product: 2017143 — B
A. Ksp=[1.3x10^{-4}]^2 [1.3x10^{-4}]
B.Ksp = [2.6x10^{-4}]^2 [1.3x10^{-4}]
C. Ksp = [1.3x10^{-8}] [1.3x10^{-4}]
D. Ksp = [1.3x10^{-8}] [1.3x10^{-4}]

353. Aqueous solution of KBr was added to the aqueous solution of $MgBr_2$.. Due to common Brions equilibrium is disturbed. To reach the state of new equilibrium which reaction will occur;
2018-07 Eng
A) $K^+_{aq} + Br^-_{aq} \rightarrow KBr$
b)$Mg^{++}_{aq} + 2Br^-_{aq} \rightarrow MgBr_2$
c) both are possible
d) common ion effect is not applicable to this system

354. Which reaction do you think has highest value of K_c? — A
2018-71 Eng
A)$H_2 + I_2 \rightarrow 2HI$
b) ester + water $\rightleftharpoons$ acid +alcohol
c) $Cl + Cl \rightarrow Cl_2$
d) $C + 2H_2 \rightarrow CH_4$

355. — B
The solubility of $Ag_2\,Cr_2\,O_7$ at 25°C was 2.0 x10^{-5} M
K_{sp} value is; 2018-195 Eng
A) 3.2x10^{-14} B) 4.0x10^{-10}
C)8.0x10^{-25} D) 8.0x10^{-10}

356. Choose the one that cannot be classed as buffer system: 2018188 Eng — B
A)KH_2PO/H_3PO_4
B) $NaClO_4$ /$HClO_4$
C) CH_3COOH/CH_3COONa
D) NH_4 OH/NH_4Cl

CHAPTER: 8 ACIDS, BASIS AND SALTS

357. The specie with strongest conjugate base in the solution among the following; 2018-188-Eng — D
a) HI b) HNO_3
c) CH_3COOH d) HClO4

Weak acid have strong conjugate bases and strong acid have weak conjugate basis. As CH_3 COOH is weak acid its conjugate base will be strong.

358. Choose which one of the following can not be classed as buffer solution; 2018-96-Eng — B
a) KH_2PO_4 / H_3PO_4
b)$NaClO_4$ /$HClO_4$
c) CH_3COOH/CH_3COONa
d) NH_4OH/NH_4Cl

Buffers solution is made of;
1. Weak acid and its salt with strong base → pH less than 7 (acidic)
2. CH_3COOH/CH_3COONa
3. Weak base and its salt with strong acid →pH more than 7 (basic)

4. NH_4OH/NH_4Cl

No.	Question	Ans	Explanation
359.	Choose acids that are showing leveling effect. i] $HClO_4$ ii] HI iii] HCl iv] HF 2017-35-Med a)i and iv b) i,iii and iv c)iii and iv d) i,ii and iii		$HClO_4$,HI and HCl shows leveling effect because these are strong acid, HF weak acid so it does not show leveling effect.
360.	Ka values of some compounds are given below, select the correct ordeR of acidic strength i] $H_2O \rightleftharpoons H^+ + OH^-$ Ka = 1x 10^{-14} ii] $ROH \rightleftharpoons H^+ + RO^-$ Ka = 1x 10^{-18} iii] $RCOOH \rightleftharpoons H^+ + RCOO^-$ Ka = 1x 10^{-5} iv] $C_6H_5OH \rightleftharpoons H^+ + C_6H_5O^-$ Ka = 1x 10^{-10} 2017-121-Med a) ROH > H_2O > C_6H_5OH >RCOOH b) C_6H_5OH > H_2O > ROH > RCOOH c) RCOOH > C_6H_5OH > H_2O > ROH d) RCOOH >ROH > C_6H_5OH > H_2O	C	The stronger the acid, the larger will be Ka. As $10^{-5} > 10^{-10} > 10^{-14} > 10^{-18}$ so RCOOH > C_6H_5OH > H_2O > ROH
361.	Which of the following ions can act both us bronsted acid and base in solvent water? **[2015-16 MEd]** A) CN^- B) SO_4^{-2} \ C) CHO_3^- D) PO_4^{-3}	C	Bronsted Acid is Proton donor specie & Bronsted base is proton acceptor. CHO_3^- can donate and accept electron
362.	The proton acceptor is: **[2015-135 MEd]** A) NH_3 B) BF_3 C) HCI D) H^*	A	NH_3 accepts proton and becomes NH_4^+
363.	Which one of the following acids has a strong conjugate base? **[2015-136 MEd]** A) CH_3 COOH B) HCI C) HNO_3 D) H_2 SO_4	A	Weak acid have strong conjugate bases and strong acid have weak conjugate basis. As CH_3 COOH is weak acid its conjugate base will be strong.
364.	The pH of 0.001M aqueous solution of NaOH is: **[2015-146 MEd]** A) 6 B) 13 C) 11 D) 12	C	0H = 0.001M = 10^{-3}, Thus pOH = 3, As pH + pOH =14 so pH= 14-3=11
365.	The aqueous solution of which one of the following compounds maintain its pH constant? **[2015-154 MEd]** A) CH_3 COOH and $(NH_4)_2$ SO_4 B) NH_4 NO_3 and KNO_3 C) NH_4 OH and NH_4 C l D) NH_4 OH and NaCI	C	The solution which maintain pH is called buffer solution.It is prepared from weak acid & its salt with a strong base like **CH_3 COOH/CH_3 COONa** OR weak base and its salt with a strong acid e.g; **NH_4 OH and NH_4 Cl**
366.	According to the Bronsted and lowery concept which of the following species cannot function as an acid? **[2010-101 Eng]:** (a)SO_4^{-2} (b) $H3O^-$ (c) HSO_4^- (d) $\overset{+}{N}H_4$	A	SO_4^{-2} has double negative charge and can't lose more electrons, so it can't be acid.
367.	Which of the following ions can act as a bronsted acid and base in water? **[2010-144 MEd]** (a) HCO^- (b) CN^- (c) NO_3^- (d) PO_4^{3-}	A	
368.	Compounds which tend to donate electron pair are known as Lewis bases or nucleophile. Which one of the following is not a Lewis base? 2006-20 **MEd]** (a) CH_3-NH_2 (b) PH_3	C	$AlCl_3$ is Lewis acid which can accept electron pair so it cannot be Lewis base but it is Lewis acid.

	(c) $AlCl_3$ (d) H_2O		
369.	Which one of the following is electron deficient compounds: 2008-110 MEd] (a) NH_3 (b) PH_3 (c) PCl_3 (d) BCl_3	D	BCl_3
370.	The smaller the value of Pka: [2013-08 MEd] (a) The weaker the base (b) The stronger the base (c) The stronger the acid (d) None of the above	C	The stronger the acid, the larger will be Ka value and smaller will be pKa value. Ka and pKa value are inversly proportional.
371.	Which one of the following acids has the highest pH value: 2006-05 MEd] (a) HCl(aq) (b) HNO_3 (aq) (c) HF (aq) (d) H_2SO_4 (aq)	C	$P_H \propto \frac{1}{Acidity}$, As HF is weakest acid in the options so its pH value is highest.
372.	An acid is a substance which accepts: **[2014-162 MEd]:** a) An electron pair b) Proton c) An electron d) Pair of proton	A	An acid is a substance which accepts An electron pair or lose a proton.
373.	Pka values of some acids are given below: Choose the weaker acid? **[2016-112 MEd]** (a) $HClO_4$ (–10) (b) HBr (–9) (c) H_2SO_4 (–3) (d) HCl (–7)	C	The stronger the acid, the larger will be Ka value and smaller will be pKa value. -3 is largest value so it is weaker acid.
374.	What is the concentration $\frac{moles}{litre}$ of nitric acid solution having pH of 4? **[2016-173 MEd]** (a) 4 (b) –4 (c) 10^{-4} (d) 10^{-10}	B	

CHAPTER-9: CHEMICAL KINETICS

375.	The main difference between catalyst and enzyme is : 2018-95-Med a) enzyme are sharp in action than catalyst. b) catalyst used in large concentration than enzymes. c) catalyst are inorganic while enzyme are organic in nature. d) enzyme need pH while catalyst does not need so.	C	catalyst are inorganic which is used in chemical industry for many product manufacturing while enzyme are organic in nature and mostly present inside the human body.
376.	The minimum energy below which no reaction occur on reactant molecules: 2018-166-Med a) Average kinetic energy of the molecule. b) P.E of the molecule. c) Free energy of the molecule. d) Activation energy of the molecule.	D	Activation energy of e=the molecule are the minimum energy molecules below which no reaction occurs.
377.	Higher the activation energy of the reaction; 2018- 45-Eng a) Slow is the rate of reaction. b) Fast is the rate of reaction. c) Moderate is the rate of reaction. d) Activation energy is not related to the rate of reaction.	A	If activation energy is higher,less molecule will have enough energy to react and thus slow will be the rate of reaction.

No.	Question	Ans	Explanation
378.	In transition state, the reactant are: 2018-197-Eng a) Highly stable b) Moderate Stable c) Highly unstable d) In the Low energy State	C	Transition state is highly unstable and impossible to separate , also it has high energy than reactants and as well as products.
379.	According to transition state, the reacting molecules form some kind of hypothetical structure, that has i) lose the structure ii) the ability to rotate iii) the ability to rotate 2017-36-Eng a)i and ii b)ii and iii c)i and iii d)i,ii and iii	D	Transition state has lose structure, anility to vibrate and rotate
380.	Consider the following reaction: $2FeCl_3 + 6KI \rightarrow 2Fe_2 + 6KCl + I_2$ Rate = $[FeCl_3]^1[KI]^1$. Chose the correct molecularity and order of a reaction. 2017-18-Med a)2 and 2 b)6 and 2 c)8 and 3 d)8 and 2	D	The order of the reaction is second. The molecularity of an elementary reaction is defined as the minimum number of molecules, atoms or ions of the reactants(s) required for the reaction to occur and is equal to the sum of the stoichiometric coefficients of the reactants in the chemical equation of the reaction.
381.	The rate law equation for reaction is given as $\frac{dx}{dt}$ = K $[FeCl_3]^3$ $[KI]^2$ the reaction is: **[2015-125 MEd]** A) First order B) Second order C) Third order D) Pseudo first order	C	Its third order Book example
382.	The rate of reaction is defined as **[2010-80 Eng]**: (a) Dc/dt (b) Dt/dc (c) dc.dt (d) $(dc)^2/(dt)^2$	A	Its old book but Dc/dt is right.
383.	The rate law for the reaction A→ C + k is given as: Rate = K[A] the unit of K will be: [**2012-100 Eng**]: (a) mole^{-1} dm^3 s^{-1} (b) mole^{1}dm^{-3} s^{-1} (c) s^{-1} (d) mole^{-1} dm^3	C	Rate = K[A] → conc/s = K conc → k =1/s
384.	For which reaction of the unit of rate constant "K" is the same as that of the reaction rate? 2008-139 **MEd]**: (a) Zero order (b) first order (c) second order (d) third order	A	Zero order, its old book MCQs
385.	The unit of 1st order rate constant are: 2009-15 **MEd]**: (a) Sec (b) Sec^{-1} (c) Mol.dm^{-3} sec^{-1} (d) None of above.	B	The unit of rate is Mol.dm^{-3} sec^{-1}
386.	The unit of Kc or the system: 2006-55 **MEd]**: $N_2O_4 \rightleftharpoons 2NO_2$ is: (a) Dimension (1.0 with no unit) (b) Mole dm^3 (c) Mole dm^{-3} (d) Mole^2 dm^3	C	Kc = produc t/ reactant Kc = $[NO_2]^2/[N_2O_4]$ Kc= [Mole dm^{-3}]^2/[Mole dm^{-3}] Kc = Mole dm^{-3}
387.	Consider the following general reaction IA+IB → Products rate of this reaction is expressed as $Rate = K[A]^1[B]^1$ the correct order of reaction	A	The order of the reaction is second. The molecularity of an elementary reaction is defined as the minimum number of molecules, atoms or ions of the reactants(s) required for

	and molecularity is: 2008-98 MEd]: (a) 2:2 (b) 2:3 (c) 3:2 (d) 3:3		the reaction to occur and is equal to the sum of the stoichiometric coefficients of the reactants in the chemical equation of the reaction.
388.	A zero order reaction is one whose rate is independent of 2015-98 MEd (a) Temp of the reaction (b) Concentration of the reactants (c) Concentration of the products (d) Material of the vessel in which the reaction is carried out	B	A zero order reaction is one whose rate is independent of concentration of reactant , the change in reactant does not effect rate of reaction.
389.	For a certain chemical reaction the slope of the plot was determined and plotted against the concentration (a — x)2 and a straight line was obtained. It indicates that the reaction is of:[2012-57 MEd]: (a)First order (b) Second order (c) Third order (d)Zero order	B	As straight line is obtained it means rate increase with increase in concentration and the concentration is square so its second order.
390.	If half life of a certain chemical reaction is denoted by the relationship given bellow: $t_{\frac{1}{2}} = \frac{1}{Ka^1}$ Where a is initial concentration what will be the order of the reaction? [2012-89 Eng]: (a) first order kinetics (b) second order kinetics (c) third order kinetics (d) fractional order kinetics	B	Old book MCQs, not important for ETEA. But remember it.
391.	Which of the following is correct; 2007-159 MEd]: a. Molecularity of a reaction is same as the order of reaction b. In some cases molecularity of a reaction is the same as order of reaction c. Molecularity of a reaction is more than orderof reaction d. All are correct	A	Molecularity of a reaction is same as the order of reaction
392.	………………..is the chemical method used for the determination of reaction rate: [2012-60 MEd]: (a) Conductometry (b) Polarimetry (c) pH metry (d) Volumetric analysis	D	Volumetric analysis is the chemical method used for the determination of reaction rate:
393.	The order of chemical reaction can be measure by: [2012-86 Eng]: (a) Half life method (b) differential method (c) Ostwald method (d) all of these	D	The method by which order of reaction can be found is (a) Half life method (b) differential method (c) Ostwald method (d) Isolated method → isolated method is in the book.
394.	A catalyst is more effective when it is in the finely divided state because: 2009-167 MEd]: (a) The valence electrons are easily available (b) This increases the surface area of the catalyst (c) It attains equilibrium quickly (d) All of the above	B	The catalyst used when such process that reaction occurs at surface , so finally divided state, the surface area increase and reaction occurs more fastly and quickly. This is for gas and solid reaction.

395.	Change in concentration of a reactant is plotted against time and the slope $\frac{dx}{dt}$ determined. The value of $\frac{dx}{dt}$ are ploted against $(a-x)^2$ a straight line is obtained. It may be concluded that the reaction is: **[2014-113 MEd]** A) First order b) Second order c) Third order d) Zero order	B	As straight line is obtained it means rate increase with increase in concentration and the concentration is square so its second order.
396.	The addition of a catalyst to a chemical reaction changes:**[2014-21 Eng]**: (a) the enthalpy (b) the entropy (c) The activation energy (d) The free energy	C	The catalyst decrease the activation energy so more molecules can react and reaction rate increases.
397.	Choose the one which is not the assumption of collision theory of reaction rate: **[2016 -104 MEd]** (a) For chemical reaction to occur molecule/ particles must colloids (b) For reacting molecules/ Particles must possess a certain minimum amount of energy, the activation of energy (c) Every collision is not productive (d) For hydrogen molecule formation from atoms require specific orientation	D	Collision molecular theory said that reaction to occur reactants must collide in specific orientation with specific energy, as hydrogen as diatomic molecule so it does not require specific orientation.

CHAPTER-10: SOLUTIONS & COLLOIDS

Molality

398.	Colloidal particles can be separated by using; 2017-47 A. Ordinary filter paper B. Coarse filter paper C Fine Filter paper D. Extremely fine filter paper	D	
399.	10.0 dm^3 gas cylinder containing mixture of various gases $50cm^3$ of nitrogen gas is in the mixture what is the the concentration of N_2 gas in part per billion (ppb); 2017-199 A) $\frac{50}{1000}$ x 10^9 B) $\frac{50}{10,000}$ x 10^9 C) $\frac{50}{100,000}$ x 10^6 D) $\frac{50}{1000}$ x 10^6	B	
400.	If the force of attraction exists between the particles of dispersed phase and the dispersion medium terms, the soil is called: 2017180 Eng A. Lyophilic B. Lyophobic C. Hydrophilic D. Hydrophobic	A	
401.	Select completely immiscible pair of liquids: A. Phenol-water system B. Trimethylamine and water system C. Carbon disulphide and water system D.Ethanol and water system	C	

402. The molality of 2.0 g NaOH (Mr=40 g/mol) in 250 g distilled water a 4°C will be exactly equal to: 2018- Eng
A) 0.20 m B) 0,25 m
C) 1.20 m D) 0.5 m

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403. The melting point of a crystalline solid by the addition of impurities; 2018118 Eng
A) Increases
B) Decreases
C) Remains the same
D) 1st decreases then increase

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404. A student dissolved 50.5g KNO_2 (KNO_3 = 101.0 g/mol) in 1000g distaled water and allowed to boil. The solution started boiling at; 2018-eng
A) 100.52^0C B) 100^0C
C)101.04^0C D) KNO_3 is insoluble in water

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405. Aiman in laboratory dissolve 4g of NaOH in 250ml of water. The molarity of this solution is: **[2015-MEd]**
A) 0.4M `B) 4M
C)0.2M D) 0.1M

A

We know that Molarity=moles/Litre,
Now moles = mass/ molar mass → 4/40 = 0.1 mol and 250ml = 0.25 L
So Molarity=no of moles/Litre = 0.1/0.15 = 0.4M

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406. 2.3g of ethanol (C2H5OH) is added to 500g of water determine the molality of the resulting solution; **[2010-MEd]**
(a) 0.01 molal (b) 0.1 molal
(c) 1.1 molal (d) 1.0 molal

B

given data: mass of water = 500g or 0.5 kg, mass of ethanol = 2.3 g, we will find molar mass that is 12 x 2 + 5+16+1= 46 so we cal also find no of moles that is n = $\frac{m}{M} = \frac{2.3}{46}$ = 0.05. now find molality by formula Molality = $\frac{no\ of moles}{1\ kg} = \frac{0.05}{0.5}$ = 0.1 molal

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407. The 2% solution by weight of sodium chloride solution is prepared. The molality of this solution is: **2007 MEd]**
(a) .34 molal (b) 0.25 molal
(c) 2 molal (d) 0.02 molal

A

2% solution means 2 gm NaCl dissolved in water so
Mass of NaCl = 2g and solution is 100 g or 0.1 kg as 1 kg= 1000 g
Molarity = moles/Kg and mole = n/M
Molarity = n/M kg = 2/58.5 x 0.1 = 0.34 molal

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408. If 20.0 cm^3 of 0.5 M solution is dituted to 1.0 dm^3. What will be its new concentration? **2007 - [2013 MEd]**
(a) 0.001 M (b) 0.01 M
(c) 1.0 M (d) 10.0 M

A

1000 cm^3 = 1 dm^3 so 20.0 cm^3 =0.02 dm^3
and M = n/dm^3 → n = M x dm^3= 0.5 x 0.02= 0.01 mole
now if solution is dituted to 1.0 dm^3 then M = n/ dm^3 = 0.01/1 = 0.01 mol

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409. To what volume in ….. must 50.0ml of 3.50 M H_2SO_4 be diluted in order to make 2 M H_2SO_4? **2008 MEd]**
(a) 25 (b) 60.1
(c) 87.5 (d) 93.2

C

: given M =2M so by using M = n/V →V= n/M→ V = n/2 eqi 1, now we have to fine n value for this equation from {50 ml or 0.05 L and 3.50 M} M = n/V → n =M x V → 3.50 x 0.05 = 0.175 mol. Eqiotion 1 becomes V= n/2 = 0.175/2 =0.0875 L = 87.5 ml

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410. A solution of 2.0 g NaOH dissolved in 1000g of water has the following concentration. **2005MEd]**
(a) 0.50m (b) 0.05M
(c) 0.05N (d) 0.05m

B

m = $\frac{n}{1hg\ or\ 1000g}$= here n = $\frac{mass}{Molar\ mass} = \frac{2}{40}$ = 0.05
so m = = $\frac{0.05}{1000g}$ = 0.05

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411. .1000 Mole of NaCl was dissolved in 1.000 dm^3 distilled water at 298K. The concentration of resulting solution is: **[2011-Eng]**
(a) 5.85 M (b) 1.00 M
(c) 0.1000 M (d) <0.1000 M

C

given data; no of moles = 0.1000 mole and Volumes = 1.000 dm^3. we know that M = $\frac{no\ of\ moles}{1\ litre\ or\ 1dm3}$ = so putting values , $\frac{0.1000}{1.000}$ = 0.1000M

412. 10ml of 1.5 M NaOH solution is neutralized by 20ml of a M HCl solution. The value of a will be: [2010 Eng]
(a) 1.0 (b) 0.75
(c) 0.5 (d) 0.25

B

given :V = 10 mL, M = 1.5 by M=n/L → n = MxL we will find n, which is 1.5 x 10 mL. Now if V is 20 m L the new volume by forumula M =n/V is V = n/M = $\frac{1.5 \, x \, 10mL}{20 \, mL}$ = 1.5/2

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413. The 2% solution by weight of sodium chloride solution is prepared. The molality of this solution is: 2006 MEd]
(a) .34 molal (b) 0.25 molal
(c) 2 molal (d) 0.02 molal

A

2% solution means 2 gm NaCl dissolved in water so
Mass of NaCl = 2g and solution is 100 g or 0.1 kg as 1 kg= 1000 g
Molarity = moles/Kg and mole = n/M
Molarity = n/M kg = 2/58.5 x 0.1 = 0.34 molal

Roult's law

414. The vapour pressure of pure acetone is 347 mm Hg. A mixture of 58.0 g acetone and 2.0 g of water is made. According to roult's law, what is the partial pressure of the acetone in this mixture? [2011-Eng]
(a) 382 mm Hg (b) 298 mm Hg
(c) 242 mm Hg (d) 312 mm Hg

d

actona formula is C_3H_6O and its molar mass is 58.08. its number of mole is n = mass / molar mass→ 58/58=1. The number of moles of water are 2/18 = 0.1111 mole.
Now mole friction of acetone is $\frac{1}{1+0.111} = \frac{1}{1.111} = 0.900$. now by roults law;
$P_A = P_A^0 X_A$ = 347 x 0.900 = 312 mmHg

Colligative properties of dilute solutions

415. Pure water freezes at 0 °C and boils at 100 °C at standard conditions. Calcium chloride was added to pure watr. What dou you expect about its freezing point and boiling point. [2011-Eng]
A) No change in its freezing point and boiling point
B) Freezing point increases and boiling point decreases.
C) Freezing point increases and boiling point increases
D) Freezing point decreases and boiling point increases

D

According to Colligative properties of solution, Elevation of Boiling Point occurs so boiling point will increase and depression of freezing point occurs so freezing point will decrease.

Solubility

416. The solubility of solute depends on: [2011 Eng]
(a) Temperature of solution (b) Quantity of solvent
(c) Quantity solute (d) All the three choices

d

solubility is mout of grams of solute dissolved in 100 gm of solvent so it depends on quantitiy of solute and solvent as well as it depends upon temperature and pressure.

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417. Salts which dissolve in water with evolution of heat. The effect of temperature on their solubility will be: [2015-MEd]
A) Increases with increase in temperature
B Decreases with increase in temperature
C) Solubility does not change
D) In some cases it increases while in others it decreases

b

as heat is evaluate so It is type of exothermic solution & in such cases increase in temperature decrease the solubility because it already loss heat and does not need more. Like wise for endothermic reaction solubility increase with increase in temperature.

Q	Question	Ans	Explanation
418.	Which of the following ions has largest heat of hydration **2007 MEd]** (a) Ba^{+2} (b) K^{+1} (c) Li^{+1} (d) Be^{+2}	d	heat oh hydration is directly proportional to charge and inversely proportional to radius, so Ba^{+2} and Be^{+2} have more heat of hydration on basis of charge as compared to rest of other, on basis of radius Be^{+2} have small radius to it have more heat of hydration. → heat of hydration α Q/r
419.	Water has a vapour pressure of 23.75 at 25^0c what is the vapour pressure of a solution sucrose if its mole fraction is 0.25? **[2010-MEd]** (a) 15.2 torr (b) 17.8 torr (c) 23.8 torr (d) 29.7 torr	b	we know that $P = X_1 P^0$, here P^0 is given which is 23.75 but need X_1 which Mole fraction of solvent, We know that $X_1 + X_2 = 1$ then $X_1 = 1 - X_2 = 1 - 0.25 = 0.75$. so putting values in $P = X_1 P^0$, we get = 0.75 x 23.75 = 17.8 torr,

Mole friction

Q	Question	Ans	Explanation
420.	A solution contains 2 moles of sucrose's in 6 moles of water. What is the mole fraction of sucrose? **[2016-Eng]** (a) 0.25 (b) 0.75 (c) 0.5 (d) 3.0	**a**	X1 = X1/X1+X2 = 2/2+6 = 2/8= 0.25
421.	A solution has three components A, B and C. the mole fraction of A and C are 0.15, 0.45 respectively the mole fraction of is; **[2016-Eng]** (a) 0.25 (b) 0.005 (c) 0.40 (d) 0.60	**c**	we now that sum of mole friction = 1 so X1+ X2+X3 =1 → X2 = 1 – 0.15 - 0.45 = 0.40 Now check 0.15 + 0.45 + 0.40 = 1

Properties of colloids

Q	Question	Ans	Explanation
422.	The stability of colloidal system depends on: **[2016-Eng]** (a) Charge on the particle (b) Solvation (c) Brownian motion (d) All of the above	d	the charged particles attract solvent molecules which form a layer around them. Th solvation depends on the affinity of solvent towards the atoms and group of atoms forming suface of particle, while brownain motion counteracts the force of gravity on the colloidal particles and partly responisvle for stability of the colloidal system.
423.	The osmotic pressure of dilute solution is given below by relationship: **[2016 MEd]** (a) $\pi = \frac{MRT}{C}$ (b) $\pi = \frac{RCT}{M}$ (c) $\pi = \frac{MR}{TC}$ (d) $\pi = \frac{RC}{TM}$	b	the osmotic pressure of dilute solution is given by: $\pi = \frac{RTC}{M}$

Parts per million, billion and trillion

Q	Question	Ans	Explanation
424.	A water sample contains 3.8×10^3g of mercury per kilo gram of the sample. What is the concentration of mercury in parts per million? **[2016-MEd]** (a) 3.8 ppm (b) 38 ppm (c) 0.38 ppm (d) 380 ppm	A	given date; water sample $=3.8 \times 10^{-3}$g $= 3.8 \times 10^{-6}$ kg and mercury mass 1 g. We know that ppm $= \frac{wt.\ or\ vol.\ of\ solute}{wt. or\ vol. of\ solvent} \times 10^6 = [3.8 \times 10^{-6} /1] \times 10^6 = 3.8$ ppm

CHAPTER-11: THERMOCHEMISTRY

No.	Question	Ans	Explanation
425.	A piston in a gas supply pump has an area of 500 cm^2 and it moves a distance of 30 cm during one stroke. The pump moves the gas against a fixed pressure of 4000 Pa. the work done by the piston during on stroke is: **2018-Eng** A) 60 J B)6.0×10^3 J C)6.0×10^5 J D)6.0×10^7 J	A	
426.	Neutralization is always an exothermic phenomena. Which neutralization reaction given below evolves more heat: **2018-Eng** A)$NaOH + HClO_4$ B)$KOH + HNO_3$ C)NaOH + H2SO_4 D)All evolve same heat.	D	
427.	Students were decomposing $CaCO_3$ placed in a China dish by heating using burner in the laboratory. The "system" in this experiment is: **2018-Med** a)China dish b)Burner c)Laboratory d) $CaCO_3$	D	
428.	Addition of soluble impurities into a liquid & solid respectively causes: **2018-Med** A) Increase in boiling point of liquid and decrease in melting point of solid B) Increase in both boiling and melting points C)Decrease in boiling point of liquid and increase in melting point of solid D) Decrease in both boiling and melting points.	A	
429.	The study of heat changes accompanying a chemical reaction is known as **2005-143 MEd** (a) Thermo – chemistry (b) Thermodynamics (c) Electro chemistry (d) Chemical kinetics	A	The study of heat changes accompanying a chemical reaction is known as Thermo chemistry.
430.	Which one of the following is not a state function? **2013-110 Eng** (a) Enbthalpy (b) Free energy (c) Work (d) Energy	C	Work and energy are not state funcitons.
431.	The first law of thermodynamics has a statement which implies that: **2012-29 MEd** (a) No heat enters or leaves the system (b) The temperature remains constant (c) All work is mechanical (d) Energy is conserved	D	The first law of thermodynamics has a statement which implies that Energy is conserved.
432.	A chemical system is sealed in a strong rigid container at room temp and then heated vigorously change in work done during process is: **2010-119 MEd** (a) Positive (b) Negative (c) Zero (d) Constant	C	A chemical system is sealed in a strong rigid container so volume does not change and if no volume change occur, no work is done. **$W = P \Delta V$**
433.	The change in enthalpy is a measure of the heat reaction at: **2009-45 MEd** (a) Constant volume (b) Constant pressure and volume (c) Variable pressure (d) Constant pressure	D	Enthalpy is the amount of heat entered or leaved at constant pressure.
434.	The first law of thermodynamics has a statement which implies that: **2013-49 MEd** (a) No heat enters or leaves the system (b) The temperature remains constant	D	The first law of thermodynamics has a statement which implies that Energy is conserved.

(c) All work is mechanical
(d) Energy is conserved

No.	Question	Ans	Explanation
435.	The change in enthalpy at constant pressure, ΔH is equal to: **2013-142 MEd** (a) $\Delta H = q + P\Delta V$ (b) $\Delta H = qp = \Delta E - P\Delta V$ (c) $\Delta H = \Delta E + P\Delta V$ (d) $\Delta H = q - P\Delta V$	C	The change in enthalpy at constant pressure: $\Delta H = \Delta E + P\Delta V$
436.	The enthalpy of the elements at 1 atm pressure and 298 K is arbitrary given the value of: **2012-141 MEd** (a) 0.1 (b) 1.0 (c) 29.8 (d) Zero	D	The enthalpy at stander state has given value arbitrarily zero.
437.	The standard molar enthalpy of formation is denoted by: **2012-92 Eng** (a) ΔH (b) ΔH^0 (c) ΔH^0_{273} (d) ΔH^0_{298}	B	ΔH^0 donate standard enthalpy change.
438.	Select the correct statement about lattice energy: **2012-144 MEd** (a) The energy absorbed when 1 mole of ionic crystal Lattice is formed from its constituent ions in the gaseous state. (b) The energy liberated when 1 mole of an ionic crystal Lattice is formed from its constituent ions in the gaseous state (c) The energy liberated when 1 mole of an ionic crystal Lattice is splitted into its constituent ions in the gaseous state (d) None of the above	B	Definition of lattice energy; The energy liberated when 1 mole of an ionic crystal Lattice is formed from its constituent ions in the gaseous state.
439.	The net heat change in a chemical reaction is same whether it takes place in one step or several steps. This law is known as **2005-84 MEd** (a) First law of thermodynamic (b) Henery's law (c) Hess's law (d) Joule's law	C	Hess' Law; The net heat change in a chemical reaction is same whether it takes place in one step or several steps.
440.	Choose the correct statement about Born Haber cycle: **2012-95 Eng** (a) Born Haber cycle is a process for a applying Hess's law to the standard enthalpy changes in the formation of covalent compounds. (b) Born Haber cycle is a process for applying Hess's law to the standard enthalpy changes in the formation of ionic compound. (c) Born Haber cycle is a process for applying Hess's Law to the standard enthalpy changes in the formation of ionic and covalent compounds. (d) None	B	Born Haber cycle is a process for applying Hess's law to the standard enthalpy changes in the formation of ionic compound like NaCl.
441.	Which is not used in calculating the lattice energy of crystalline solids? **2014-145 MEd** a) Haber process b) Born Haber cycle c) Hess's law d) Enthalpy changes	A	Born Haber cycle is a process for applying Hess's law to the standard enthalpy changes in the formation of ionic compound like NaCl.
442.	Providing heat to the following reaction causes it shift to the right **2014-191 MEd** $CO_{2(2)} + 2H_2O_{(g)} \rightarrow CH_{4(g)} + 2O_{2(g)}$ The reaction can therefore be described as: a) Spontaneous b) Adiabatic	C	The burning of CH_4 is exothermic process while its backwards reaction is endothermic. The given reaction is backward reaction of burning of CH_4.

c) Endothermic d) Exothermic

No.	Question	Ans	Explanation
443.	For which of the following standard heat of formation is not zero: **2016**-128 **Eng** (a) Cl_2 (g) (b) Na (s) (c) Br_2 (g) (d) Hg(*l*)	C	Only element in their standard state have zero standard heat of formation values.

CHAPTER-12: ELECTROCHEMISTRY

No.	Question	Ans	Explanation
444.	The best known and the most highly developed fuel cell is the hydrogen/ oxygen fuel cell. This is known as 2007-149 **MEd]**: (a) Proton exchange membrane cell (b) Bacon cell (c) Regenerative cell (d)None of the above	B	Fuel cell is also known as Bacon cell. (out of course but important for other entry test.)
445.	Choose the incorrect statement about the corrosion? 2017-155-Med a)corrosion cannot be completely eliminated b) Employing modern techniques corrosion can be completely eliminated. c) Corrosion process can be slowed down by certain methods. d) the presence of acid oxide in the environment can accelerate the process of corrosion.	B	corrosion cannot be completely eliminated but Corrosion process can be slowed down by certain methods
446.	Food article spoilage involves oxidation reduction process to prevent this reaction we usually add: 2017-154-Med a) an oxidizing agents b) a reducing agent c) an acid d) a base	B	Food article spoilage involves oxidation reduction process to prevent this reaction we usually add antioxidant means a reducing agent.
447.	Choose the wrong statement; A) operating life of fuel cell is unlimited. b) electrode in fuel cell may be porous solid and may contain catalyst. c) the fuel in the fuel cell can be gas, liquid, solid or solution. d) in fuel cell, the cell products cannot be regenerated	D	operating life of fuel cell is unlimited, electrode in fuel cell may be porous solid and may contain catalyst, the fuel in the fuel cell can be gas, liquid, solid or solution.in fuel cell, the cell products are regenerated
448.	The cathode in lead storage battery is made of: **[2015-**164 **MEd]** A) Lead B) Lead oxide C) Led hydroxide D) None of the above	B	As on cathode reduction (gain of electron) takes place and lead oxide can gain electron,so cathode in lead stoege battery is made of Lead oxide.
449.	The oxidation state of carbon in Na_2C_2 is: **[2015-**165 **MEd]** A) +4 B) +2 C) –1 D) –4	C	Na_2C_2 = 0, So 2(+1)+2C=0 & 2C= -2 Thus C=-2/2 =-1.
450.	If we pass current through the sucrose solution the galvanometer will not show any deflection because sucrose molecules: **[2010**-21 **MEd]**: (a) Move towards cathodes (b) Move towards anode (c) React with water (d) Remain neutral	D	The galvanometer does not show deflection means that it remains neutral and does not move towards anode or cathode.

451. Substances dissolved in water react better because: 2008-126 **MEd**];
(a) water brings them close
(b) water helps them in bonding
(c) water dissolves them in ions
(d) water reacts with them

Answer: C — When substance dissolved in water, it changes into ions which move easily in water towards each other and react better.

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452. Sodium hydroxide acts on Aluminum oxide to form: **[2012-98 MEd]**:
(a) $NaAlO_3$ (b) $Na_3A1_2O_6$
(c) $NaAlO_2$ (d) $NaAl_2O_3$

Answer: C — $NaOH + Al_2O_3 \rightarrow NaAlO_2$

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453. In a Galvanic cell the following reaction takes place: $2H_2O \rightleftharpoons O_2 + 4H^+ + 4e$, it occurs at; 2012-52 **MEd**
(a) Cathode (b) Anode
(c) External conductor (d) Both a & b

Answer: D — As water loss electrons and we call it oxidation. Oxidation always occurs at anode.

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454. Which statement is correct: 2009-72 **MEd]**:
(a) Standard Hydrogen Electrode (SHE)always acts as anode
(b)'SHE' may act as cathode or anode depending upon the reduction potential of the counterpart
(c) 'SHE' always acts as cathode in voltaic cells
(d) None of the above

Answer: B — SHE act as anode as well as cathode depending upon the potential of joint elements.

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455. The stronger the reduction potential the more difficult it is to: 2009-75 **MEd]**
(a) Oxidize the compound
(b) Reduce the compound
(c) Electrolyze the compound
(d) None of the above

Answer: A — The stronger the reduction the potential, the stronger it well reduce other and it will be difficult for it to oxidize other.

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456. Which of the following cannot be displaced from their salt solution by copper? 2008-35 **MEd]**:
(a) Ag (b) Au
(c) Pt (d) Zn

Answer: D — Because zinc loss electrons as compared to copper.

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457. The emf of a galvanic cell can be calculated from 2007-163 **MEd]**:
(a) The size of the electrode
(b) The pH of the solution
(c) The amount of metal in the anode
(d) The E^o values of the half cell

Answer: D — emf of galvanic cell depend upon E^0 of the cell and is different for different elements.

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458. What will happen if a block of copper metal is dropped into a beaker containing a solution of 1M $FeSO_4$? **[2011-192 Eng]**
$Cu^{2+} + 2e \rightarrow Cu$ 0.34 V $Fe^{2+} + 2e \rightarrow Fe$ -0.44 V
(a) The copper will dissolve with no other change
(b) The copper will dissolve and Fe will be precipitated out
(c) The copper will dissolve with the evolution of H_2 gas
(d) No reaction will occur

Answer: D — **The Reducion of Potential of copper is high while oxidation potential fo Fe is high.In this case Fe has alreadu lost electrons so Cu can not further oxidize it.**

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459. What will happen if a block of copper is dropped into a beaker containing a solution of 1.0 M of $ZnSO_4$? **[2013-27 Eng]**:
(a)The copper will dissolve with no other change
(b)The copper will dissolve zinc metal will be deposited
(c)The copper will dissolve with the evaluation of $H_2(g)$

Answer: D — The reduction of potential of carbon is high while oxidation potential of Fe is high. In this case Fe has already lost electrons so Cu can not further oxidize it.

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460. Which statement given below is not true for the reaction? **2013-100 Eng**
$Fe^{3+} + e \rightarrow Fe^{2+}$

Answer: C — Here Fe^{+3} have positive charge and can gain electrons, gaining of electrons is called reduction and so its oxidizing

	(a) Fe3+ is being reduced (b) The oxidation state of Fe has changed (c) Fe3+ could be referred to as a reducing agent in this reaction (d) Both Fe^{3+} and Fe^{2+} are called cations		agent not reducing agent.
461.	Select the strongest reducing agent: [2012-71 MEd]: (a) Cl^{-1} (b)Ne (c)Na^+ (d) Ca^{+2}	A	From given option cl have negative charge and it can easily loss electron and loss of electron is called is oxidation and so reducing agent.
462.	Considering the standard reduction chart, the strong reducing agent value is: [2013-145 MEd]: (a) Small negative values (b) Large negative values (c) Small positive values (d) Large positive values	B	the more –Ve value of standard reduction potential in electrochemical series indicates the strong reducing agent.
463.	The oxidation number of Cl in $Ca(ClO_3)_2$ 2006-47 MEd]: (a) -1 (b) +3 (c) +5 (d) -6	C	
464.	What is the oxidation number of hydrogen in metal hydrides 2017-18 MEd]: (a) 0 (b) +1 (c) 2 (d) -1	D	In metal hydride the oxidation number of hydrogen is -1.
465.	Which of the following is NOT considered to be an oxidizing agent? [2010-178 MEd]: (a) MnO_2 (b) Cl_2 (c)NaOH (d) Na_2O_2	C	
466.	Primary cells are used in calculators for long service life the desirable quality of the cell is: [2010-70 MEd]: (a) Low energy densities (b) No self discharge rates (c) High self discharge rates (d) High energy densities	B	Primary cell have no losses and can be used for long time.
467.	Lithium is generally used as an electrode in high energy density batteries, because 2007-35 MEd]: (a) It is the lightest metal (b) It has high negative reduction potential (c) It is quite reactive (d) It does not corrode easily	B	Due t high reduction potential of li it is used in lithium ion batteries.
468.	$PbSO_{4(8)}$ + 2e $Pb_{(8)}$ + SO_4^{-2} -0.36v $PbO_{2(8)}$ + $4H^+$ + $SO4_2$- + 3e → $PbSO_{4(8)}$ + 1.69v The two halfcell reactions above are involved in the discharge of a lead storage battery. The potential of a single cell lead storage is: [2013-120 Eng]: (a) 1.33 volts (b) 4.10 volts (c) 2.66 volts (d) 2.06 volts	A	Cell potential = **E**anode +**E**cathode(Anode is PbO_2 while Cathode is Pb) **1**.69 - 0.36 = 1.33 Volt
469.	Which statement is correct while recharging the automobile battery? [2013-148 MEd]: (a) Pb is converted to PbO_2. (b) $PbSO_4$is converted to Pb (c) Pb is converted to $PbSO_4$ (d) None of the above	C	During Recharging both Pb and PbO2 are converted to PbSO4 while the reverse occurs in Discharging
470.	The best known and the most highly developed fuel cell is the hydrogen/ oxygen fuel cell. This is known as [2013-30 Eng (a) Proton exchange membrane cell (b) Bacon cell (c) Regenerative cell	B	Fuel cell is also known as Bacon cell. (out of course but important for other entry test.)

(d)None of the above

471.	Which of the following is the oxidizng agents in given reaction: **2013-200 Eng** $Zn + Cu^{2+} \longrightarrow Zu^{2}+ + Cu$ (a) Cu^{+2} (b) Zu (c) Zu^{2+} (d) Cu	D	Cu can gain electrons and zinc can loss. So gain of electrons is called reduction and so its oxizing agent, Cu is oxidizing agent.
472.	Which is strong electrolyte? **[2016-60 MEd]** (a) $Ca(OH)_2$ (b) $SiCL_4$ (c) KCl (d) $SrCl_2$	C	KCl,NaOH,H_2SO_4 are strong electrolytes.
473.	Chromium compounds in which oxidation state of chromium is 2 + behaves as a: **2016-70 MEd** (a) Strong oxidizing agent (b) Strong reducing agent (c) Very weak oxidizing agent (d) Very weak reducing agent	B	Chromium have either+2 or +3. Chromium can loss one more electron to become +3 after +2 so it will los electron. Loss of electron is called oxidation and is strong reducing agent.
474.	choose the true statement regarding the reaction given below $2Na_{(g)} + Cl_{2(g)} \rightarrow 2NaCl_{(s)}$ **[2016 82 MEd]** (a) Chloride is oxidized and sodium is reduced (b) Chlorine acts as an oxidizing agent and sodium as reducing agent (c) Chlorine acts as a reducing agent and (d) None of the above	B	Sodium loss electron and as oxidized and chlorine got reduced. So chlorine act as an oxidizing agent and sodium as reducing agent.
475.	A cell is constructed of the following two half cells. What is E^0 of the cell? **[2016-175 MEd]** $Ag^+ + e^- \leftrightharpoons Ag$ + 0.80 V, $Al^{3+} + 3e^- \leftrightharpoons Al$ – 1.67 V (a) 2.47 V (b) 0.087 V (c) – 0.87 V (d) 5.81 V	A	As both values are of reduction so larger will be same and smaller value sign will be change 0.80 +1.67 =2.47
476.	Which of the following is spontaneous reaction? **[2016-194 MEd]** (a) $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$ (b) $2NaCl_{(g)} \rightarrow 2Na_{(g)} + Cl_{2(g)}$ (c) $Zn^{2+} + Cu \rightarrow Zn + Cu^{2+}$ (d) $2Fe(OH)_3 \rightarrow 2Fe + 3O_2 + 3H_2$	A	A because it can occur by itself
477.	In which of the following reaction hydrogen acts as oxidizing agent. **[2016-46 MEd]** (a) $H_2 + Cl_2 \rightarrow 2HCl$ (b) $C_2H_4 + H_2 \rightarrow C_2H_6$ (c) $2Na + H_2 \rightarrow 2NaH$ (d) $N_2 + 3H_2 \rightarrow 2NH_3$	C	$2Na + H_2 \rightarrow 2NaH$, In this reaction hydrogen loss electrons and sodium gain it, so loss of electrons occurs in oxidizing agents.
478.	Which is strong electrolyte? **2016-60 MEd** (a) $Ca(OH)_2$ (b) $SiCL_4$ (c) KCl (d) $SrCl_2$	C	KCl,NaCl and H_2SO_4 are strong electrolytes
479.	A cell is constructed of the following two half cells. What is E^+ of the cell? **2016-175 MEd** $Ag^0 + e^- \leftrightharpoons Ag$ + 0.80 V, $Al^{3+} + 3e^- \leftrightharpoons Al$ – 1.67 V (a) 2.47 V (b) 0.087 V (c) – 0.87 V (d) 5.81 V	A	As both values are of reduction so larger will be same and smaller value sign will be change 0.80 +1.67 =2.47

CHAPTER-13 S & P BLOCK ELEMENTS

360.	What is the product when chlorine gas is passed over element silicon in powdered state and heated it produce colorless liquid having formula? 2017-Med A. $SiCl_2$ B.$SiCl_4$ C.Si_2Cl_3 D. SiCl	B
361.	Chlorine gas dissolves in water to some extent to give: 2017-Med A. Yellow Colored solution B. Greenish Colored solution C. Bluish Colored solution D. Colorless solution	
362.	Compound resistant to thermal decomposition is: 2017-Med A. Li_2CO_3 B. $NaNO_3$ C. $Ba(NO_3)_2$ D. Na_2CO_3	D
363.	Phosphorus (white) catches fire in air and and burns with the formation of white smoke the product formed is: 2017-Med A.Phosphorus (iii) oxide B.Phosphorus (v) Oxide C.Phosphorus (ii) oxide D. Both (A) & (B)	D
364.	Steam of chlorine is passed over heated sulphur and form an orange coloured foul smelling liquid having formula: 2017-Eng A.SCl_2 B.S_2Cl_2 C.S_2Cl D. Mixture of SCl_2 and S_2Cl_2	
365.	The compound which purely acidic character is: A.Mg $(OH)_2$ B. $AI(OH)_3$ C.$Si(OH)_4$ D. Non of the above	C
366.	The flame colour of Na is yellow, Ca is brick red and Ba is apple green. Which radiations among the following travel with highest velocity 2018-Eng A)Yellow B)Green C)Violet D)All travel with the same.	D
367.	Thermal stability is related to the polarizing power of the cation in the compound. Which of the following compounds having cation with a strong polarizing power? 2018-Eng A)$MgCl_2$ B)$AICl_3$ C)LICl D)$BaCl_2$	
368.	Compound having the ability of showing inert pair effect is: 2018-Eng A)NH_3 B)H2O C)$SnCl_2$ D)All of the above	C
369.	Select hydrogen carbonate which is comparatively most stable towards thermal decomposition. 2018-Eng A)$NaHCO_3$ B)$KHCO_3$ C)$RbHCO_3$ D)$CsHCO_3$	D
370.	White phosphorous catch fire spontaneously in air forming mixture of oxides. Select the correct oxides: 2018- Eng A)P_4 O_6 and P_2 O_3 B)P_5O_{10} and P_3O_6 C) P_2O_4 and P_4O_8 D) P_4O_6 and P_4O_{10}	D

No.	Question	Ans	Explanation
371.	The cation that distort the electron cloud of NO_3^- ion more and facilitates its decomposition is: 2018-Med A)Mg^+ B)Mg^{++} C)Cs^+ D)Be^{++}	A	
372.	Three reactions are given $H_2SO_4 + 2HF \rightarrow F_2 + SO_2 + 2H_20$ $H_2SO_4 + 2HBr \rightarrow Br_2 + SO_2 + 2H_20$ $H_2SO_4 + 8HI \rightarrow 4I_2 + H_2S + 4H_20$ The strongest reducing agent in these reactions is: 2018-Med, A)HI B)HF C)HBr D)All of the above	A	
373.	SiO_2, is the only oxide that reacts with: 2018-Med A)HCl_{aq} B) KOH_{aq} C)Steam D)SO_3	B	
374.	Whenever Pb shows inert pair effect it always form: 2018-Med A) Ionic bond B)Covalent bond C) Co-ordinate covalent bond D)Metallic bond.	A	
375.	Choose the correct reaction: **[2015**-185 **MEd]** A) $PbO + 4NaOH \rightarrow Pb(OH)_4 + 2Na_2O$ B) $PbO + 2NaOH + H_2O \rightarrow$ Na2 [Pb(OH0$_4$] C) $PbO + NaOH + H_2O \rightarrow Na[Pb(OH)_3]$ D) $PbO + 4NaOH + H_2O \rightarrow Na_4[Pb(OH)_6]$	B	
376.	Which one would you class it as more metallic in character? **[2011**-06 **MEd]**: (a)As (b)Bi (c)C (d)Sb	B	B/c in periodic table on going across a period, the Metallic character decreases i.e. with increase in Atomic number, b/c size of Atom decreases &attraction for ė is greater on Right Side of Periodic Table, while in group, going down the metallic character increases
377.	Which one of the following compounds has last ionic character? 2005-184 **MEd]**: (a) $CC\ell_4$ b) KCl (c) Mg $C1_2$ (d)$BaCl_2$	A	B/c as the metallic character across a period decreases, so the halides for**MEd]** show a decrease in Ionic and increase in covalent character. Halides of Alkali & Alkaline metals are generally ionic while those of VI & VII are covalent in Nature.
378.	Hydration energy is the heat evolved or absorbed when: **[2011**- **MEd]**: (a) One mole of gaseous ions is dissolved in one mole of water (b) One mole of ions in solid state is dissolved in one mole of water. (c)One mole of gaseous ions is dissolved in water to give infinitely dilute solution (d) One mole of ions in solid state is dissolved to form concentrated solution	C	

No.	Question	Ans	Explanation
379.	Which of the following ions has largest heat of hydration; 2007-59 **MEd]** (a) Ba^{+2} (b) K^{+1} (c) Li^{+1} (d) Be^{+2}	D	B/c Hydration energy highly depend upon charge/size Ratio. Eg; for given set of ions of group; charge to size ration decreases, the hydration energy also decreases on contrary, the hydration energy increase significantly by moving from left to righting periods as the charge to size ration increases as found in metal of 3rd period.
380.	The behavior of $PbCl_2$ and $PbCl_4$ respectively are: **[2011**-13 **Eng]** (a) Ionic and covalent (b) Covalent and ionic (c) Covalent and coordinate covalent (d) Ionic and coordinate covalent	A	B/c generally the halides of lower oxidation state are ionic & those of higher oxidation state tend to be covalent. * $PbCl_2$ is ionic * $PbCl_4$ is covalent
381.	Which one will show ionic bonding? **[2012**-04 **Eng]**: (a) NaH (b) $PbCl_4$ (c)HCl (gas) (d)PCl_3	A	
382.	The hydrides of Be and Mg are classified as inter**MEd]**iate hydrides. Their behavior is: **[2011-Eng]**: (a) Non-volatile and ionic in nature (b) Volatile and covalent in nature (c) Polymeric and covalent in nature (d) Crystalline and covalent in nature	C	
383.	The bond form between boron and Hydrogen is: **[2011**-165 **MEd]**: a) Ionic (b) Covalent (c) Coordinate covalent none of the above (d)None of the above	B	
384.	In which of the following a covalent bond is not likely to exist? **[2010**-149 **MEd]**: (a) Br (b)SiF_4 (c) CaO (d) CH_4	C	because ionic bond is for**MEd]** between strong electro positive and least electro positive atoms.
385.	Select the most stable covalent hydride: **[2011**-19 **MEd]**: (a) BiH_3(b) NH_3 (c) HF (d) SbH_3	C	
386.	Most of the oxides of non-metals combine with water to form: **[2011**-193 **MEd]** (a) hydrogen gas (b) salt and water (c) a base (d) An acid	D	
387.	A metallic oxide when added to water would most likely form a(n) **[2010**-04 **MEd]** (a) Base (b) Acid (c) Salt (d) Basic anhydride	A	
388.	Which one of the following forms the most acidic oxide: 2009-68 **MEd]** (a) Al (b) Sl (c) Fe (d) P	D	
389.	Select the oxide which will be acidic in nature: **[2012**-71 **Eng]**:	A	

No.	Question	Ans	Explanation
	(a) P_2O_5 (b) CaO (c) K_2O (d) BaO		
390.	16. Choose the correct order of decreasing basic str**Eng**]th. **[2012**-160 **Eng]**: (a) $MgO > Na_2O > P_4O_{10} > Al_1O_3$ (b) $Na_2O > MgO > Al_1O_3 > P_4O_{10}$ (c) $P_4O_{10} > Na_2O > MgO > Al_1O_3$ (d) $Al_1O_3 > MgO > P_4O_{10} > Na_2O$	B	
391.	Which one of the following oxides exhibit amphoteric properties? **[2013**-118 **MEd]**: (a) K_2O B) MgO (c) ZnO (d) CaO	C	Oxides of relatively less-electro +tive elementS i.e; BeO, Al_2O_3, Bi_2O_3& ZnO are amphoteric.
392.	Calcium is found in nature as $CaSO_42H_2O$. This is commercially called: **[2011**-12 **Eng]**: (a) Epsom salt (b) Dolomite (c)Magnesite (d) Gypsum	D	Epsom salt – $Mgso_4.7H_2O$, Dolomite – Mg Co_3 – Ca Co_3 Magnesite – Mg Co_3
393.	Potassium is found in nature as carnalities, its composition is: **[2011**-23 **MEd]**: (a) $KAISi_3O_4$ (b) $KClMgCl_26H_2O$ (c) KCl (d) KCl. $Al_2O_3.2H_2O$	B	
394.	Fajan's rule states that small highly charged ions tend to form more: **[2011**-26 **MEd]**; (a) Ionic compounds (b) polymeric compounds (c) covalent compounds (d) Coordination compound	C	
395.	Beryllium, a member of alkaline earth metal, is almost as hard as: **[2011**-29 **MEd]**: (a) Calcium (b) Potassium (c) Iron (d) Magnesium	C	
396.	Beryllium, an alkaline earth metal resists towards complete oxidation because: **[2011**-15 **Eng]**: (a) It is less reactive (b) The oxidation process is slow (c) It forms hard protective coat of BeO (d) None of the above	C	
397.	Reason for alkali metals to be soft is that: 2006-**MEd]**; (a) They are less metallic in nature (b) There is only one valency (c) They do not have close packed structures (d)They have high I.E	C	
398.	Which oxide sodium metal predominantly forms in oxygen? **[2011**-18 **Eng]**: (a) Na_2O (b) Na_2O_2 (c) Na_2O_3 (d) NaO_2	B	
399.	Select the correct statement; **[2011**-33 **MEd]**: (a) All alkali metal hydroxides are stable to heatexcept LiOH (b) All alkali metal hydroxides are unstable to heat (c) All alkali metal hydroxides are stable to heat except CsOH (d) All alkali metal hydroxides are stable to heat	A	
400.	Refratory bricks used for furnace lining are for**MEd]** by mixing and drying **[2011**-36 **MEd]**: (a) MgO and clay (b) $MgCO_3$and clay (c) $MgSO_4$ and clay (d) $MgCO_3$ $CaCO_3$	A	
401.	Which one of the following is most ionic? **2014**-59 **MEd]**	C	Charge on Cation&Cation sizes

No.	Question	Ans	Explanation
	(a) NaCl (b) $MgCl_2$ (c) KCl (d) $AlCl_3$		are directly propional to Ionic character
402.	Milk of magnesia is used for treatment of acidity in stomach, its formula is: **[2014**-61 **MEd]** (a) $Mg(OH)_2$ (b) $MgSO_4$ (c) $Ca(OH)_2$ (d) $CaSO_4$	A	
403.	The electro negativity of [III]A element first decreases and then increases. This behavior is due to poor shielding of: **[2011**-39 **MEd]** (a) S – electron (b) P– electron (c) d– electron (d) f– electron	C	
404.	Sodium tetra borate $Na_2B_4O_7.10H_2O$is; **[2011**-43 **MEd]**: (a) Colemanite (b) Borax (c) Diaspore (d) bauxite	B	Colemanite → $Ca_2B_6O_{11}$. $5H_2O$ * Dias pore→ Al_2O_3. H_2O
405.	The compound, Borax is used in borax bead test for the detection of cations. The molecular formula of compound is: **[2011**-25 **Eng]**: (a) $Ca_2B_6O_{11}5H_2O$ (b) H_3BO_3 (c) $Na_2B_4O_7 . 10H_2O$ (d) $(C_2H_5)_3BO_3$	C	H_3BO_3→ Boric Acid * $(C_2H_5)_3BO_3$→ Ethyl Borate
406.	On strong heating orthoboric acid gives. 2007-128 **MEd]** (a) Meta boric acid (b) Tetra boric acid (c) Boric anhydride (d)None of the above	C	
407.	Thermite process is: 2009-52 **MEd]** (a) Exothermic (b) Endothermic (c) Reversible (d) None of the above	A	
408.	Sodium hydroxide acts on Aluminum oxide to form: **[2012**-89 **MEd]**: (a) $NaAlO_3$ (b) $Na_3A1_2O_6$ (c) $NaAlO_2$ (d) $NaAl_2O_3$	D	
409.	Molecular formula of silica is: **[2012**-174 **Eng]**: (a) SiO_4 (b) SiO_3 (c) SiO_2 (d) Na_2SiO_3	C	
410.	Sodium Carbonate when fused with sand forms sodium silicate which is commonly known as: **[2011**-49 **MEd]**: (a) Soda glass (b) water glass (c) Jenna glass (d) pyrex glass	D	PbO → Flint Glass * Pyrex & Jena contain B_2O_3
411.	Group 5th elements arsenic and antimony are considered as: **[2011**-59 **MEd]**: (a) Metallic (b) Non metallic (c) Metalloids (d) Transition elements	C	
412.	Select the oxide which is in solid state at room temperature: **[2011**-56 **MEd]**: (a) NO_2O_5 (b) N_2O (c) NO_2 (d) N_2O_3	A	
413.	Ring test is shown by compounds having: **[2012**-23 **MEd]**: (a) Sulphate radical (b) Chloride radical (c) Nitrate radical (d) None of the above	C	
414.	Nitric oxide was passed through FeSO4 solution a brown compound was for**MEd]** as formula is: **[2011**-48 **Eng]**: (a) $FeSO_4$ NO (b) $FeSO_4 (NO)_2$ (c) $Fe(SO_4)_2$ NO (d) None of above	A	

No.	Question	Ans	Explanation
415.	Nitric oxide acts as / an: **[2011**-38 **Eng]**: (a) oxidizing agent (b) reducing agent (c) both as reducing and oxidizing agent (d) neither oxidizing nor reducing agent	C	
416.	In the action of HNO_3 on metals, the evolution of NO_2 is favored by; 2007-32 **MEd]**: (a) Conc. HNO_3 (b) Dilute HNO_3 (c) Fuming HNO_3 (d) Very dilute HNO_3	A	
417.	Phosphorus trihalides are readily hydrolysed as shown below: **[2013**-168 **MEd]**: $PX_3 + 3H_2O \rightarrow H_3PO_3 + 3HX$ Generally moving from fluorine to iodine rate of hydrolysis: (a) Increases (b) Decreases (c) Remalns unchanged (d) First increases and then decreases	A	
418.	Phosphorus acid H_3PO_3 is highly soluble in water and behaves as: **[2011**-35 **Eng]**: (a) Monobasic Acid (b) Dibasic acid (c) Tribasic acid (d) None of the above	B	
419.	Which one of the following is not a commonly occurring sulphur compound? 2005-190 **MEd]**: (a) H2S (b) Ag_2S (c) SO_2 (d) SO_3	B	
420.	In contact process for the manufacture of sulphuric acid, the impurity Arsenic is removed by freshly precipitated ferric hydroxide which absorbAseneous oxide to form: **[2011**-45 **Eng]**: (a) Fe As O_4 (b) Fe As_2 O_4 (c) Fe As_3 O_4 (d) $FeAsO_3$	D	
421.	The catalyst used in the contact process is easily poisoned by: 2008-131 **MEd]**: (a) Nitrous oxide (b) carbon dioxide (c) Arsenic oxide (d) nitrogen oxide	C	
422.	The compound used in borax bead test for the detection of basic redicals to form colored bead is: **[2014**-60 **MEd]**: (a) H_2BO_2 (b) $(C_2H_5)_3BO_3$ (c) $Ca_2B_6O_{11}5H_2O$ (d) $Na_2B_4O_710H_2O$	D	
423.	Which one of the following does not exist? **[2014**-186 **MEd]**: (a) HBO_2 (b) HFO_2 (c) H_3PO_3 (d) $HBrO_2$	B	
424.	Select an element which exists in liquid state at room temperature. **[2012**-11 **Eng]**: (a) Cl_2 (b) F_2 (c) Br_2 (d) I_2	C	* Cl_2, $F_2 \rightarrow$ Gases I_2, As_2, $\rightarrow$ Solid.
425.	Choose the inter halogen compound; **[2011**-42 **Eng]**: (a) OF_2 (b) BrF_5 (c) $HgBr_3$ (d) H1	B	
426.	In which of the following atoms, the 1s orbital is the smallest in size? **[2011**-199 **MEd]**: (a) Bromine (b) Chlorine (c) Fluorine (d) Iodine	C	Down the group size of Halogen atom increases

427.	Which one of the following does not have +7 oxidation; 2008-62 **MEd]**: (a) F (b) Cl (c) Br (d) I	A
428.	$3Ca(PO_4)_2.CaF_2$ is the formula of: **[2012**-121 **Eng]**: (a) chlorapatitie (b) fluorapatite (c) phosphorite (d) None of these	B
429.	The oxidation power of halogen depends upon: **[2011**-83 **MEd]**: (a) Energy of dissociation (b) Electron affinity of atoms (c) Hydration energies of Ions (d) All of the above	D
430.	Which of the following oxy acids of chlorine is least oxidizing in nature; 2007-154 **MEd]**: (a) HOCI (b) $CHIO_2$ (c) $HCIO_3$ (d) $HCIO_4$	A
431.	Which one of the following is strongest acid? **[2013**-130 **Eng]**: 2009-138 **MEd]**: (a) $HClO_4$ (b) $HClO_3$ (c) $HClO_2$ (d) HClO	A
432.	The oxide of chlorine, Cl_2O_2 in nature is: **[2011- Eng]**: (a) strongly basic (b) weakly basic **(c)strongly acidic** (d) weakly acidic	C
433.	Which of the following is Hypo chlorous acid? **[2013**-112 **MEd]**: (a) HCIO (b) $HCIO_2$ (c) $HCIO_3$ (d) $HCIO_4$	A
434.	The bleaching action of bleaching powder is due to "available chlorine" it is the amount of chlorine. **[2011**-63 **MEd]**: (a) that is required for the preparation of bleaching powder (b) site free when excess of sulphuric acid is added to the bleaching powder. (c) that is required for the generation of the hypochlorite (d) Both B and C	B
435.	What is the trade name of titraflora ethylene polymer? 2006-59 **MEd]** (a) Polystoene (b) Backlite (c) Nylone (d) Teflone	D
436.	Which one of the following is thermosetting polymer? [2012-148 Eng]: (a) nylon-6, 6 (b) Poly ethylene (c) Bakelite (d) Teflon	D
437.	Teflon is prepared by the polymerization of; **[2012**-49 **Eng]**: (a) butadiene (b) vinyl cynide (c) propylene (d) tetra fluoroethene	D
438.	Which of the following is not correct: 2008-**MEd]**: (a)Xe is the most reactive among the rare gases. (b) He is an inert gas. (c)radon is obtained from decay of radium (d) the most abundant rare gas found in atmosphere is He.	D

439.	The formula of mustard gas is: **[2011**-66 **MEd]**: (a) $(C_2H_2Cl_2)_2S$ (b) $(C_2H_4Cl_2)_2S$ (c) $(C_2H_3Cl_2)_2S$ (d) $(C_2H_4Cl)_2S$	D	
440.	In which group all the elements donot belong to the same block and all the elements of valence electrons? 2007-127 **MEd]**: (a) Zero group (b) First group (c) Third group (d) Seventh group	A	
441.	Which of the following is not correct: 2008-**MEd]**: (a)Xe is the most reactive among the rare gases. (b) He is an inert gas. (c)radon is obtained from decay of radium (d) the most abundant rare gas found in atmosphere is He.	D	He → 0.0005% * Ne → 0.0015% * Ar → 0.932%
442.	Choose the correct name of Ba_2XeO_4; **[2011**-73 **MEd]** (a) Barium Xenate (b) Barium Xenthate (c) Barium Prexenate (d) Barium Perxenthate	D	
443.	In the periodic table period represents: **2011**-31 **Eng]**: (a) The number of electron in the outer most shell (b) The metallic and non metallic characters of the elements (c) The chemical properties of an element (d) The number of the shells in an element	D	
444.	The order of reducing power of halide ion is: **[2015**-84 **MEd]** A) $I^{-1} > Br^- > Cl^- > F^-$ B) $F^- > Cl^- > Br^- > I^-$ C) $I^{-1} > Cl^- > F^- > Br^-$ D) $Br^- > Cl^- > I^- > F^-$	A	**Eletronegativity is is inversely proportional to reduction power.**
445.	The first lionization energy of an atom depends on: **[2015**-175 **MEd]** A) Charge on nucleus B) Screening effect C) Electronic configuration D) All of the above	D	
446.	Choose the correct order of decreasing basic str**Eng]**th: **[2016**-129 **Eng]** Reaction of water with magnesium is: (a) Slow (b) Fast (c) It is slow in the start and become fast at the end (d) It is slow in the start and become very slow at the end	D	
447.	Al_2O_3 Reaction of water with magnesium is: **[2016**-139 **Eng]** (a) Slow (b) Fast (c) It is slow in the start and become fast at the end (d) It is slow in the start and become very slow at the end	D	
448.	When chlorine water is added to K1 solution the solution become **[2016**-147 **Eng]**s (a) Pale yellow (b) Violent (c) Brown (d) Red	C	
449.	Complementary colour of orange colour is: **[2016**-159 **Eng]** (a) Red (b) Green (c) Green blue (d) Yellow	C	
450.	XYZ are the elements in the same short period of the periodic table the oxide of X is amphoteric the Exide of Y is basic and the Exide of Z is acidic what is the order of increasing atomic number for these elements? **[2016**-45 **MEd]** (a) XYZ(b) XZY (c) YXZ (d) ZXY	C	

451. Select the correct reaction of the following [**2016**-81 **MEd]** A
(a) $SnO + 4NaOH \rightarrow Sn(OH)_4 + 2Na_2O$
(b) $SnO + 4NaOH \rightarrow Na_4Sn(OH)_4$
(c) $SnO + 2NaOH \rightarrow Na_2Sn(OH)_4$
(d) None of the above

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452. Lithium reacts with air to form: **[2016**-181 **MEd]**
(a) Li_2O (b) Li_2N
(c) $Li_2O_2 + Li_2CO_3$ (d) Both (a) & (b)

CHAPTER-14: D & F BLOCK ELEMENTS

453. In movies during fight a blood red solution is using as an artificial blood. Which of the following complex ion is used for this solution? 2017-Med C
A. $[Fe(H_2O)^6$
B. $[Cu(NH_3)_4(H_2O)_2]^{+2}$
C. $[Fe(SCN)(H_2O)_5]^{+2}$
D. $Fe(H_2O)_6$

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454. Coordination number six complex having d2Sp3 hybridization exist in: 2017-Med D
A. Tetrahedral shape
B. Square planar shape
C. Trigonal bipyramidal shape
D. Octahedral shape

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455. Arrange the following oxide of chromium in increasing acidic character: 2017-Med B
A. $CrO > Cr_2O_3 > CrO_3$
B. $CrO_3 > Cr_2O_3 > Cr0$
C. $Cr_2O_3 > Cr0 > CrO_3$
D. $CrO_3 > CrO > Cr_2O_3$

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456. Many hexaaqua complex ions can undergo reaction with water as given below C
$[Fe(H_2O)_6]^{+2}aq + H_2O \rightleftharpoons [Fe(H_20)_5 OH]^+ H_3O^+$
The reaction is classed as: 2017-Med
A.Redox reaction
B. Acid base reaction
C.Decomposition reaction
D.Substitution reaction

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457. Consider the following reactions. C
1.$C_2H_2(g) + H_2(g) \rightleftharpoons C_2H_6(g)$
ii. $N_2(g) + 3H_2 \rightarrow 2NH_3(g)$
Choose the catalysts employed for the reaction. 2017-Med
A. Ni for both reactions (i) and (ii)
B. Fe.Or for both the reactions (i) and (ii)
C. Ni for the reaction (i) and Fe_2O_3 for (ii)
D. Fe_2O_3 for the reaction (i) and Ni (ii)

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458. Most solutions containing ferric ions are usually yellow or yellowish brown. This is due to the formation of B
2017- Eng
A. $[Fe(H_20)_6]_{3+}$ B. $[Fe(H_20)_5(OH)]^{2+}$

	C. $[Fe(H_20)_4(OH)_2]^+$ D. $[Fe(H_20)_3(OH)_3]^0$	
459.	Compounds of vanadium exists in the following oxidation states; 2017-Eng 5+, 4+, 3+, 2+, The compounds in the 3+ and 2+ oxidation states behave as A.Good oxidizing agent B.Good reducing agent C. Weak oxidizing agent D. Weak reducing agent	B
460.	Choose the correct name of the compound K(PtCI); 2017-Eng A Potassium hexachloro platinum B. Potassium hexachloroplatinate C. Potassium hexachloroplatinate D. Potassium chloroplatinate	D
461.	Reaction between peroxodisulphate ions and iodide ions is given below, $S_2O_8^- + 2I^- \rightarrow 2SO_4- + I_2$ .Choose the suitable catalyst, 2017181 Eng A.Ni^{+2} B.Fe^{2+} & Fe^{3+} C.Fe^{3+} D.Fe^{2+}	B
462.	The following dynamic equilibrium exists between CrO_4^{2-} and $Cr_2O_7^-$ ions in solution. $CrO_4^{2-} \rightleftharpoons Cr_2O_7^-$ The equilibrium is sensitive to acids and bases.. Choose the correct statement, if NaOH is added to the system under equilibrium; 2017- Eng A.Equilibrium shifts to the right B. $Cr_2O_7^-$ is decomposed to Cr_2O_3 C. Equilibrium remains unaffected D) Equilibrium shifts to the left	D
463.	Which of the following electronic configuration is/are correct? 2017-Eng i.$Cu_{29}[Ar]4S^13d^{10}$ ii.$Ti_{22}[Ar]4S^24d^2$ iii.Fe_{26} $[Ar]4S^13d^54P^1$ A) i only B) i& ii only C)ii, iii only d) i and iii only	B
464.	The compound of Cr (Chromium) with a strong reducing power is; 2018-Eng A)$K_2Cr_2O_7$ B)CrCl C) Cr_2O_3 D) None of the above	B
465.	The electronic configuration of titanium is $1S^2 2S^2 2P^6 4s^2 3d^2$; 2018-Eng A)K_2TiO_4 B) K_3TiF_6 C) $TiCl_3$ D) TiO	
466.	Choose the reagent used to test the presence of Fe ions in solution with the formation of intense red colour 2018-Eng A)NaSCN B)KSCN C)NH_4CNS D)All of the above	D
467.	The chelating ligand out of the following ; 2018-Med A) CH_3C00^- B)$(CH_2)_2(NH_2)_2$ C)SCN^- D)-NO_2^-	B

468.	The outer electronic configuration of Cu^+ Ion is $4S^0\ 3d^{10}$ with this configuration the aqueous solution of copper (I) compound is: A)Blue B)Greenish blue C)Bluish green D)Colourless.	D	
469.	Which of the following is NOT a member of transition metal? [2010-55 MEd]: (a) Scandium family (b) Iron family (c) Titanium family (d) Beryllium family	D	
470.	Which one of following electronic sub-shells the lanthanides have in the process of filling? [2012-11 Eng]: (a) 4f (b) 5f (c) 4d (d) 5d	A	Actinides → 5f
471.	Elements not found in nature synthesized in nuclear reactions and involving completion of 51 orbital are known as. [2010-32 MEd]: (a) Lanthanides (b) Transition elements (c) Rate gases (d) Actinides	D	
472.	Choose the correct electronic configuration for Scandium (Z=21): [2012-08 Eng]: (a) $2s^2 2s^2 2p^6\ 3s^2\ 3p^6\ 3d^1\ 4s^1$ (b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^1\ 4s^2$ (c) $1s^2\ 2s^2\ 2p^5\ 3s^2\ 3p^6\ 3d^1\ 4s^8$ (d) $1s^2\ 2s^2\ 2p^5\ 3s^2\ 3p^6\ 4s^2\ 4p^1$	B	
473.	What is the right configuration of an of an element with 24 electrons. [2010-200 Eng]: (a) $1s^2 2s^2 2p^6 3p^6 3d^6$ (b) $1s^2 2s^2 3s^2 2p^6 3p^6 4s^2 3d^4$ (c) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^4$ (d) $1S^2 2S^2 2p^6 3S^2 4S^1 3d^5$	D	
474.	The correct electronic configuration of Nickel (28) is: [2012-118 MEd]: (a) 1s2 2s2 2p6 3s2 3p6 3d8 4s2 (b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^7\ 4s^2\ 4p^1$ (c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^6\ 4s^2\ 4p^2$ (d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^6\ 4s^1\ 4p^3$	A	
475.	The electronic configuration of Cu(29)is: [2011-76,[2015-85 MEd]: (a) $-3s^2 3p^6 3d^{10} 4s^1$ (b) $-3s^2 3p' 3d^9 4s^2$ (c) $-3s^2 3p' 3d^8 4s^2$ (d) $-3s^2 3p' 3d^9 4s^2$	A	
476.	The highest oxidation state of Manganese–$3s^2 3p' 3d^5 4s^2$ in its compounds is: [2011-79 MEd]: a) +2 (b) +5 (c) +7 (d) +8	c	
477.	Cobalt metal generally forms colored compounds. The color is due to: [2012-125Eng]: (a) d.d electronic transition which falls in the visible range (b)p.p electronic transition which falls in the visible range (c) d.v electronic transition which falls in the visible range. (d) d.p electron transition which falls in the visible range.	B	
478.	The color of coordination compound is dimethylglyoximenickel(11) is: [2011-96 MEd]: (a) Red (b) Blue	B	

(c) Orange (d) Black

---

479. The oxidation number of cobalt in $[Co(en)_2H_2O(CN)]^{2+}$ [2011-89 MEd]: — **B**

(a)2 (b) 3
(c) 4 (d) 5

---

480. Ammonium hydroxide was added to a salt solution deep blue color was obtaine. The solution contains ions of: [2011-93 MEd]: — **B**

(a) Zn^{+2} (b) Cu^{+2}
(c) Fe^{+3} (d) Ba^{+2}

---

481. Which of the following is not transition element; [2010-88 Eng]: — **A**

(a) Zn (b) Cr
(c)Mn (d) Ni

---

482. The oxidation number of iron in $(Fe(CN)_6)^{-4}$ is: 2008-172 MEd] — **B**

(a) + 3 (b) + 2
(c) + 4 (d) + 6

---

483. Complexes with bidentate ligands are called; 2007-117 MEd]: — **B**

(a) Ligands (b) Chelates
(c) Complexes (d) None of the above

---

484. 16. $[NiCl_4]^{-2}$ is tetrahedral shaped complex, the bond angler <Cl- Ni – Cl> is; [2011-28 Eng]: — **D**

(a) 120° (b) 107° (c) 105° (d) 109°

---

485. 17. Choose the correct geometry of the coordination compound $[Ni(CN)_4]^{-2}$ [2013-160 Eng]:, [2012-108 Eng]: — **A**

(a) Square planer (b) Tetrahedral (c) Trigonalbipyramidal (d) Octahedral

---

486. 18. Choose the compound tetra amine aqua Chlorocobalt(III) chloride: [2011-99 MEd]: — **D**

(a) $\left[Co(NH_3)_4(H_2O)(Cl_2^{-2})\right]Cl_3^{-3}$ (b) $\left[\overset{+2}{Co}(NH_3)_4(H_2O)(Cl_2^{-2})\right]Cl_3^{-3}$

(c) $\left[Co(NH_3)_4(H_2O)(Cl_2^{-2})\right]Cl_3^{-3}$ (d) $\left[Co(NH_3)_4(H_2O)Cl\right]Cl_2$

Answer

---

487. Which is good quality iron are containing low phosphorus content? [2010-70 MEd]: — **D**

(a)Hematite b) Limonite
(c) Siderite (d) Magnetite

---

488. Which one is considered as fool's gold? [2012-34 Eng]: — **B**

(a) Copper metal (b) Iron pyrites FeS_2
(c) Copper glance Cu_2s (d) None

---

489. Which of the following furnaces is used for the production of wrought iron? [2013-155 MEd]: — **B**

(a) Open hearth furnace (b) Reverberatory furnace

(c) Bessemer converter (d) Blast furnace

490.	Which one of the following is not a physical property; 2005-147 MEd]: (a) Corrosion (b) Solubility (c) Melting point (d) Boiling point	A	
491.	Cons: H_2SO_4 is added to mixture of K_2Cr_2O and metal chloride is solid scale. Brown vapors are forMEd] which one is correct formula? [2013-70 Eng]: (a) $CrOCl_2$ (b) $COCl_2$ (c) CrO_2Cl_2 (d) $CrCl_6$	C	
492.	The formula of potassium manganate is; [2011-32 Eng]: (a) $KMnO_4$ (b) K_2MnO_4 (c) K_3MnO_4 (d) K_2MnO_3	B	
493.	The element which has the smallest atomic radius is: [2013-192 MEd] (a) Fe (b) Co (c) Ni (d) Cu	c	
494.	Ethylene diaminetetraacette ion (EDTA) is aopolydentate ligand it bonds to central metal atom through: [2013-165 MEd] (a) Two of its atoms (b) Three of its atoms (c) Four of its atoms (d) Six of its atoms	D	
495.	The coordination number of cobalt in the complex $[Co (H_2N CH_2CH_2 NH_2)_3]^{+3}$ is: [2013-150 Eng]: (a) 3 (b) 4 (c) 5 (d) 6	D	The number of co-ordinate covalent bonds forMEd] is called co-ordination number.Ethelenediamine is bidentate,so 6 bonds are forMEd] by it..
496.	Identify the name of coordination compound $K_4 [Fe(CN)_6]$: [2013-117 Eng]: (a) Potassium hexacyanoferrate (b) Potassium hexacyanoferrate (II) (c) Potassium hexacyanoferrate (III) (d) Potassium (I) hexacyanoferrate (IV)	B	
497.	Which of the following titrants would most likely be used as this own indicator in acid MEd]ium? [2013-88 MEd]: (a) $K_2Cr_2O_3$ (b) Iodine (c) $KMnO_4$ (d) H_2O_2	C	
498.	Chromium compounds in which oxidation state is 6+ behaves as: [2015-184 MEd] A) Strong oxidizing agent B) Strong reducing agent C) Very weak oxidizing agent D) Very weak reducing agent	a	Stable oxidation state of Chromium is $_{+}3$… Below this it act as reducing agent and above it as oxidizing agent.
499.	Select the correct formula of chlorpenta-aqua-chromium (iii) chloride. [2015-195 MEd] A) $[Cr (H_2 O)_5 Cl] Cl_3$ B) $[Cr (H_2 O)_5 Cl] Cl_2$ C) $[Cr (H_2 O)_5 Cl_2] Cl$ D) $[Cr (H_2 O)_5 Cl_3] Cl$	b	

No.	Question	Answer	Explanation
500.	The components of bronze alloy are: [2015-196 MEd] A) Copper and zinc B) Copper and tin C) Zinc and tin D) Chromium and Tin	B	
501.	Select ligand which is bidentate and can form chelates. A) CH_3 NH_2 B)PH_3 C)H_2 O D) NH_2 -CH_2 -CH_2- NH_2	D	A ligand which can donate two pairs is bidentate.Ethylendiamine is bindentate because it two donatable pairs on two nitrogen atoms.
502.	Choose the correct name of the compound given below. [2016-57 Eng] $Ag^+ C^- \equiv C^- Ag^+$ (a) Silver carbide (b) Alkynide (c) Silver dicarbide (d) None of the above	B	
503.	The compound Y $BaCu_3$ O_3 consists of: [2016-69 Eng] (a) Cu(I) and Cu(II) Cations (b) Cu(II) and Cu(III) Cations (c) Cu (III) and Cu(IV) Cations (d) Cu(II) and Cu(IV) Cations	B	
504.	The coloursof MnO_4^{-1} and mN^{2+} solution in water are respectively: [2016-77 Eng] (a) Intense dark purple colour and colourless (b) Light purple colour and colourless (c) Intense dark purple colour and brown colour (d) Light purple colour and brown colour	A	
505.	$CrO_{4(ag)}^{3-}$ and $Cr_2O_7^{2-}$ are inter convertible represented by equation: [2016-167 Eng] $CrO_{4(ag)}^{3-} + 2H_{(ag)}^{+} = Cr_2O_{7(ag)}^{2-} + H_2O(I)$ Yellow Orange In the above reaction (a) $CrO_{4(ag)}^{2}$act as base (b) Addition of base change the color from orrange to yellow (c) The addition of acid change the state of Cr from +6 to +4	A	
506.	The hydrated cations of first transition series that imparts a blue color: [2016-8 MEd] (a) Cr^{+2}, CO^{+2}, Cu^{+2} (b) Cu^{+2}, Zn^{+2}, Ti^{+4} (c) Tt^{+3}, Zn^{+2}, Cu^{+2} (d) Cr^{+3}, Tt^{+4}, Cu^{+2}	B	
507.	Select the correct order of the acids strEng]th? [2016-14 MEd] (a) CH_3COOH>>$CHCl_2COOH$>$CH_2ClCOOH$ (b) $CHCl_2COOH$>$CH_2ClCOOH$>CH_3COOH (c) CH_3COOH>$CHCl_2COOH$>$CH_2ClCOOH$ (d) $CHCl_2COOH$>>CH_2COOH>$CH_2ClCOOH$	B	
508.	A dilute hydrochloric acid is added to a flask containing time stone a gas is produced which is dissolved in time water in a test tube a white precipitate is forMEd] the precipitate is of: [2016-27 MEd] (a) $CaSO_4$ (b) $CaCO_3$ (c) $CaCl_2$ (d) $MgCO_3$	B	
509.	When small amount of ammonia is added to $CUSO_4$ solution in water, blue PPt of $[Cu(H_2O)_4(OH)_2]$ is forMEd]. The blue PPt dissolves on addition of excess of ammonia. [2016-114 MEd] The product forMEd] is: (a) $[Cu(H_2O)_2 (NH_3)_2 (OH)_2]$ (b) $[Cu(NH_3)_4 (OH)_2]$	B	

(c) $[Cu (NH_3)_4 (H_2O)_2]^{2+}$
(d) $[Cu (NH_3)_3 (H_2O_3]^{2+}$

---

510. What is the formula of Dichloro-Bis-ethylenediamine cobalt (II)? [2016-180 MEd] — A
(a) $[CO (en)_2 Cl_2]$ (b) $[CO (en)_2 Cl_2]^{2-}$
(c) $[CO (ebn)_2 Cl_2]^{1-}$ (d) $[CO (en)_2 Cl_2]^{1+}$

CHAPTER-15: ORGANIC COMPOUNDS

511. To differentiate between white ppt of AgCl and off-white ppt of AgBr we use; 2017-Med — C
a) Dil solution of NaOH b)Dil solution of $Pb(NO_3)_2$
c)Dil solution of NH_3 d)Dil solution of $FeCl_3$

---

512. All the compounds are inorganic EXCEPT: 2009-132 **MEd]**: — D
(a)$CaCO_3$ (b) CAC $_2$ (c) KCN (d) $(NH_2)CO$

---

513. All compounds are organic except; **[2011**-86 **MEd]**: — B
(a) $(H_2N)_2$ CO (b) NH_4 CNO (c) CH_3NO_2 (d) $C_2H_5N_2HSO_4$

---

514. Coal, Natural gas and petroleum are generally called: **[2013**-65**MEd]**: — A
a. fossil fuels

---

515. When coal is heated (500-1000^{0}C) in the absence of air the process is called; **[2010**-144 **Eng]**: — B
(a) Distillation (b) Carbonization
(c) Cracking (d) Reforming

---

516. Quality of fuel is judged from its octane number the best fuels are; **[2010**-173 **Eng]**: — B
(a)straight chain hydrocarbons (b) branched chain hydrocarbons
(c)cyclic compounds (d) aromatic compounds

---

517. Octane number one hundred is given to compound: **[2012**-141 **Eng]**: — A
(a) 2,2,4-Trimethylpentane (b) n-heptane
(c) n-octane (d) Iso heptane

---

518. Tetracthyl lead $(C_2H_2)_4Pb$ is used as antiknock agent and is abandoned because of its hazardous product during the combustion of fuel. The hazardous product is: **[2011**-113 **MEd]**: — C
(a) CO_2 (b) CO
(c) Lead (d) Free radical ethyc (C_2H_2)

---

519. In reforming process open chain hydrocarbons are converted into: **[2011**-119 **MEd]** — D
(a) Polymers (b) branch chain hydrocarbon (c)Ring hydrocarbons (d) Branch & Ring hydrocarbon

---

520. Cracking problem of fuel combustion can be avoided by: **[2012**-106 **MEd]**: — D
(a) Reforming (b)Improving octane number (c)Adding TEL
(d)All of the above

521.	We used $pb(C_2H_5)_4$ in the gasoline to reduce: **[2010**-20 **MEd]**: (a) Consumption of fuel (b) Price of fuel (c) Octane number of fuel(d) Knocking of **Eng]**ine	D	
522.	When n-heptane is heated in the absence of air at high temperature in the presence of catalyst, it changes to 2,2,4triethyle pentane. This process is called 2005-04 **MEd]**: (a) Cracking (b) Reforming (c) Polymerisation (d) Condensation	b	
523.	Which o the following is cycloalkane; 2007-182 **MEd]**: (a) C_6H_{14} (b)C_6H_{12} (c)C_6H_{10} (d) C_6H_8	B	
524.	Esters are represented by the general formula; 2005-171 **MEd]**: (a) ROP (b) BOOR (c) RCOOR (d) RCOOH	C	
525.	Which isomers have difference in both their physical and chemical properties? **[2013**-195 **MEd]**: (a) Chain isomers (b) Position isomers (c) Functional group isomers (d) Both A) and (B)	C	Chain and position isomerism can exist in the same compound but functional group isomerism exists in different compounds having different physical ans chemical properties.
526.	The isomerism exhibits by $C_5H_{11}OH$ is: 2009-155 **MEd]** (a) Position isomerism (b) Functional group isomerism (c) Chain isomerism (d) All of the above	D	
527.	Which is an isomer of ethanol? **[2010**-199 **MEd]**:, **[2011**-118 **Eng]**; (a) CH_3OH (b) $C_2H_5OCH_3$ (c) CH_3OCH_3 (d) $C_2H_5OC_2H_5$	C	
528.	Dimethyl ether and ethanol is an example of: **[2012**-137 **Eng]**: (a) Chain isomerism (b) position isomerism (c) Metamerism (d) Functional group isomerism	D	
529.	An organic compound having molecular formula C_2H_60 can exhibit functional group isomerism. Select the correct isomers: **[2013**-34 **Eng]**: (a) Methanol and methoxy methane (b) Ethanol and ethoxy ethane (c) Ethanol and methoxy methane (d) Methanol and ethoxy ethane	**C**	
530.	How many isomers are possible for pentane? **[2011**-58 **Eng]**: (a) 2 (b) 3 (c) 4 (d) 5	B	
531.	Which isomerism is not shown by alkene; 2007-138 **MEd]**: (a)Metamerism (b) Chain isomerism (c) Position isomerism (d) Geometrical Isomerism	A	
532.	Which type of isomerism is being exhibited by *FCH = CHF?* **[2013**-58 **MEd]**: (a) Chain isomerism (b) Structural isomerism (c) Geometrical isomerism (d) Position isomerism	C	

533.	Why is the boiling point of n-Pentane about 28'C higher than that of its 2,2-Dimethylpropane isomer? (a) The area of contact between 2,2-Dimethylpropane is small which results in weak forces of attraction. (b) 2,2-dimehlprpane molecules repel each other (c) N-pentane molecules cannot come into closer contact with each other (d) Shapes of molecules have not effect on boiling point	A
534.	Which of the following structure has a bond for**MEd**] by an overlay of Sp^2 hybrid orbital with that of *SP* hybrid orbital? **2013**-48 **MEd**]: (a) HC = CH (b) $H_2C = CH_2$ (c) $H_2C = C= CH_2$ (d) $CH_2 = CHCH_3$	C
535.	The bond angle between H - C – C bond in ethane is: **[2013**-52 **MEd**]: (a) 109.5 (b) 120 (c) 90 (d) 107.5	A
536.	25 Ethanol (CH_3CH_2OH) and dimethyl ether (CH_3OCH_3) are the best considered as: **[2014**-8 **MEd]**: (a) Structural isomers b) Stereo isomers c) Enantiomers d) Diasteromers	A
537.	Which of the following compound is assigned the octane number of 100? **[2014**-155 **MEd]**: a) n-heptane b) n-octane c) 2,3,3-trimethyl pentane d) 2,2,4-trimethyl pentane	D
538.	Diethyl ether and Methyl propyl ether are: **[2014**-20 **MEd]**: a) Conformational isomers b) Metamers c) Geometrical isomers d) Enantiomers	B
539.	A tertiary carbon is bonded directly to: **2014**-09 **MEd]**: a) 2 Hydrogens b) 2 Carbons c) 3 Carbons d) 4 Carbons	C
540.	Conc. HCI is added to a metal salt and then subjected to flame test on platinum wire. It Imparts crimson color to the flame. Which metal salt it is? **[2015-76 MEd]** A) Sodium B) Potassium C) Strontium D) Calcium	C
541.	Carbon monoxide can be converted by hydrogenolysis to alkanes by the process known as: **[2016-14 MEd]** (a) Contact process (b) Fischer-tropsch (FT) process (c) Fermentation process (d) Haber-Bosch process	B

CHAPTER-16: HYDROCARBONS

542.	Choose the correct statement about cycloalkanes: 2017-Med A. Cyclopropane and cyclobutane are liquids at room temperature. B. Cycloalkanes are insoluble in ethanol and ether but soluble in water. C. Their melting & boiling points show gradual increase with increases molecular weight. D. Both (B) & (C) are correct	C
543.	The less energetic and more stable compound among the following is: 2017-92 Med A. Cyclobutane B. Hex-1-ene	a

C. Cyclopropane D. Propene)

---

544. Propene react with hypochlorous acid to form; 2017-Med **B**

A. CH_3-CH-CH_2OH
  |
  Cl

B. CH_3-CH-CH_2C1
  |
  OH

C. CH_3 -CH-CH_2CI
  |
  Cl

D. CH -CH--- CH2
  | ||
  OH OH

---

545. Benzene gives more stable product when undergo 2017-02Med **C**

A) Nucleophilic addition reaction
B)Oxidation reaction
C)Electrophilic substitution reaction
D)Electrophilic addition reaction

---

546. The compound which can be hydrolyze by means of water is: 2017-Med **B**

A. CCl_4 B. $SiCl_4$
C. CH_4 D.Non of the above

---

547. Which compound will undergo substitution reaction faster than benzene? 2017-Med **B**

The IUPAC name of the compound given below:

a) Br
b) NH_3
c) NH_3
d) NH_3 NO

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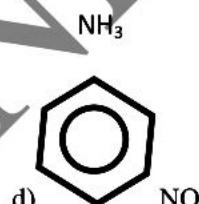
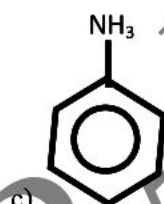
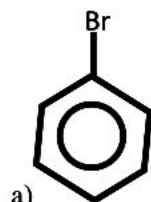
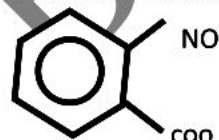

548. the IUPAC name of the compound given below is **b**

a) m-nitrobenzoic acid B. o-nitrobenzen methanoic acid
C.o-nitrobenzoic acid D.None of the above

---

549. $AlBr_3$ which is used in the alkylation of benzene possess the properties of: 2017-Med **D**

A. A catalyst B. A lewis acid
C. An electron deficient specie D. All of the above

---

550. Choose the least stable of the following butenes; **A**

A.1-Butene B.CIS-2-butene

C) Trans-2-butene D.Iso butylenes

No.	Question	Answer
551.	1,3-dihydroxybenzene is also known as: A) Catechol B.Resorcinol c)hydroquinone D.Cresol	B
552.	The carbon-carbon triple bond length in acetylene 2017-Eng A.1.09 A^0 B.1.119 A^0 C)1.39 A^0 D.1.19 A^0	D
553.	The number of chiral centres in a molecular of S-bromo 3-chloro hexan-2-oil is/are: 2017-Med a)1 b)3 c)2 d)5	B
554.	Which group when attached to benzene will increase its reactivity: 2017-Med A.-NHR^+ B-NH_3 C.-C≡N D.-COR	A
555.	The compound that cannot undergo addition reaction is: 2017-Med a) Cyclopropane B) Benzene C) Butyne D) None of the above A)More stable	D
556.	The IUPAC name of the compound 2018-Eng CH_3 | CH_3--- CH-CH_2-CH-CH-CH_3 is A)2 methyl -4- hexane B)4 isopropyl 2-butene c) 5-methyl-2-hexane D)5,5-dimethyle-2. pentene	
557.	If required conditions are provided, which compound on reaction with HOCI will not follow Markownikoff's rule: 2018-Eng A) CH_3-CH=CH-Br b) CH_3 – C = CH_2 | F	
558.	The number of Chiral center in the compound given below is/are 2018-Eng O H O ‖ | | CH_3-CH_2 --- C ----- CH --- C-C_2H_5 A)2 B)3 C)Zero D) 1	
559.	Alkene that do not follow cis-trans isomerism is: 2018Eng A) But-2-ene B) l-chloroprene C) 1,l-dichloropropene D) 1,2-dichloroethene	
560.	Cyclic alkanes with greater angle strain are always: 2018-Med A)More stable B)Less energetic C)More reactive D)Obey general formula of normal alkanes	C
561.	The Friedel crafts catalyst "$AlCl_3$" used in the substitution reactions of Benzene is a good: 2018-Med A)Electrophile B)Lewis acid C)Electron deficient specie d) bear all these properties	D
562.	The most reactive compound out of the following is; 2018-Med A)Ortho hydroxy toluene B)Ortho chloro ethyl benzene c) Phenol	A

D)Para ethyl benzoic acid

---

563. During the formation of addition polymerization, which smaller molecules you think are eliminated; 2018-Med,
A)0_2 B)HCl
C)NH_3 D) no one is eleminated

Answer: D

---

564. If the overlap of Sp^3 Hybrid orbitals in carbon atoms is smaller the bond so formed is: 2018Med
A) Weak B) Strong
C)Less energetic D) More Stable

Answer: A

565.

```
 CH3
  |
  CH – CH CH3 + Mg ether→  X+H2O→   Y
   |    |
 CH3   Br
```

In the above creation Compound Y will be an:
[2013-24 **Eng]**:
(a) Alkane (b) Alkene (c) Alcohol (d) Alkyl halide

Answer: A

Hints; This reaction takes place in two steps.In the first step Grignard Reagent(X) is forMEd].In the second stepwhen grignar reagent react with water,than an alkane (Y) is produced.S

---

566. You are electrolyzing potassium salt of a dicarboxylic acid in aqueous solution. Which product do you expect to be for**MEd]**?
2008-166 **MEd]**

a. $CH_2 = CH_2$ b. $CH \equiv CH$
c. $CHNa = CHNa$ d. None

Answer: b

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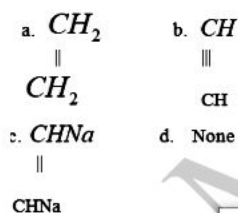

567. What the required conditions for the following reaction?
$CH_4 + Cl_2 \rightarrow CH_3Cl + CH_3Cl_2 + CHCl_3 + CCl_4 + HCl$
[2012-185 **Eng]**:
(a) Low temperature (b) Al_3O_2 catalyst 400 °C
(c) $ZnCl_2$ 250 °C (d) UV light

Answer: D

---

568. CH_4 on complete oxidation in the presence of cu as catalyst under200 atm yield: **[2012**-83 **MEd]**:
(a) Methanol (b) Formaldehyde
(c) Formic acid (d) Carbondioxide gas

Answer: C

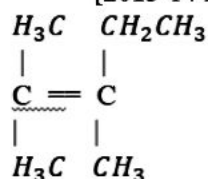
---

569. The heat of combustion of hydrocarbon is very useful source of heat and power, Consideringthe combustion reaction given below.
[2013-18 **MEd]**:
$CH_4^{(g)} + O2_{(g)} \rightarrow CO_2^{(o)} + 2H_2O$ ΔH for the reaction is.
(a) ΔH = 213 kcal/mole (b) ΔH= 213 kcal/mole
(c) ΔH= 426 kcal/mole (d) ΔH= 312 kmal/mole

Answer: A

---

570. Select proper IUPAC name of the following compound:
[2013-14 **Eng]**:

```
H3C   CH2CH3
 |     |
 C  =  C
 |     |
H3C   CH3
```

a) 2-methyl-3-ethyl-2-butene

Answer: A

(b) 3-ethyl-2-methyl-2-butene
(c) 2, 3-Dimethyl-2-pentene
(d) 2, isopropyl butane

571.	Dehydrahalogenation of alkyl halide is carried with: 2008-81 **MEd]**: (a) Alcoholic KOH (b) Aqueous KOH (c) Aqueous NaOH (d) Alcoholic HaOH	A
572.	Ethene could be obtained from ethyl bromide by: **[2012**-195 **Eng]**: (a) Hydrolysis (b) Nucleophilic substitution (c) Dehydration (d) dehydrohalogenation	D
573.	In which of the following solvents are alkenes the most soluble? 2005-45 **MEd]**: (a) Water (b) Ethyl alcohol (c) Ammonia (d) Carbon tetrachloride	C
574.	2,3 dimethyl, 2butene undergoes catalytic Hydrogenation to give; **[2011**-65 **Eng]**: (a) 2,2 dimethyl butane (b) 2 – methyl pentane (c) 2,3 dimethyl butane (d) 3 – methyl pentane	A
575.	Ethene and Ethyne can be distinguished by employing the test: **[2012**-103 **MEd]**: (a)Br_2 in organic solvent (b)Baeyer's reagent (c) Phenyl Hydrazine (d)Tollen's reagent	a
576.	Select the o/p directing group but ring deactivators of the following? **[2016**-58 **Eng]** (a) $-CH_3$ **(b) –Cl** (c) $-NO_2$ (d) –OH	b
577.	Considering the addition of hydrogen acids to alkenes, what is the correct order of reactivity? **[2012**-66 **Eng]**: (a) HCl>HBr> HI (b) HI >HBr>HCl (c) HBr> HI >HCl (d) HCl> HI >HBr	b
578.	The addition of HX to a double bond the hydrogen goes to the carbon that already has more hydrogen is a statement of: **2011**-82 **Eng]**: (a) Hund's rule (b) morkownikov's rule (c) Huckel rule (d) None of the above	
579.	If HCl is adde to ________ $CH_2 = CH - CH_3$ what is for**MEd]**? 2007-191 **MEd]**: (a) $CH_3 - CH(Cl) - CH_3$ (b) $CH_2 - C(Cl) - CH_3$ (c) $CH_2(CH_3 - Cl) = CH - CH_3$ (d) None of these	A
580.	Markownikoff's rule is NOT applicable when HBr is added to: **[2012**-177 **Eng]**: (a) 3-pentene (b) 2-Butene (c) 1-Butene (d) Propene	B
581.	Carbon-carbon double bond as compared to single bond is: **[2011**-133 **MEd]**: (a) less susceptible to oxidation (b) More susceptible to oxidation (c) Equally susceptible to oxidation (d) All of these	B
582.	Baeyer's reagent is: **[2011**-78 **Eng]**:	D

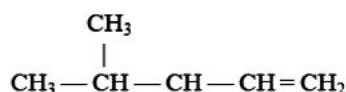
(a) $HCl + ZnCl_2$ (b) H_2NNH_2
(c) $Br_2\ in CCl_4$ (d) Dil K MnO4

583.	Which one of the following would you suggest to locate the position of the double bond between carbon atoms in an organic compound? **[2011**-189 **MEd]**: (a) Addition of Bromine water (b) Addition of HI (c) Oxidation with ozone (d) All of the above	C	
584.	Which of the following compounds on hydrolyses gives Ethyne? **[2011**-85 **Eng]**: (a) CaC2 (b)Mg_2C_3 (c) Al_4C_3 (d) $CuCl_2$	A	
585.	Ethyne has a total of: **[2011**-126 **MEd]**: (a) one σ bond, two η bonds (b) one σ bond, four η bonds (c) two σ bonds, four η bonds (d) three σ bonds, two η bonds	a	
586.	Which one of the following will be more acidic? **[2013**-104 **Eng]**: (a) 1-Pentene (b) 1-Pentyne (c) 3-Hexyne (d) 2-Pentyne	B	
587.	Metallic carbide on treatment with water give a colourless gas which burns readily in air and gives a white precipitate with $AgNO_3$ +Na $_4$ OH the gas is: 2007-23 **MEd]**: (a) CH_4 (b) C_2H_2 (c) C_2H_4 (d) C_2H_6	B	
588.	Which of the following would you consider to be comparatively more reactive? **[2013**-174 **Eng]**: (a) C_2H_6 (b) C_2H_4 (c) C_2H_2 (d) C_3H_8	B	Reactivty Order = Alkene > Alkyne > Alkane
589.	The reduction of 2-butyne to n-butane in laboratory involves: (a) The use of an oxidizing agent such as $Cr_2O_7^{-2}$ in the presence of acids. (b) The use of strong base such as KOH along with $NaNH_2$ (c) The use of hydrogen gas in the presence of Nickel as catalyst (d) The use of Al_2O_3 as catalyst and water in the form of steam	C	
590.	Benzene is the prime member of: 2009-37 **MEd]**: (a) A cyclic compounds (b) All cyclic compounds (c)Hetro cyclic compounds (d) Aromatic compounds	D	
591.	Select the correct formula of 2-methyl pentane: **[2011**-116 **MEd]**: **[2011**-55 **Eng]**: (a) C_5H_{12} (b) C_5H_{16} (c) C_6H_{12} (d) C_6H_{14}	D	
592.	Choose the correct statement; **2011**-129 **MEd]**; (a) Resonance hybrids are the weighted average of all the resonating forms (b) Resonance hybrids are generally considered as unstable. (c) Resonance hybrids are the averagely of all the resonance forms (d) Resonance hybrids are averaged of all the less stable resonating forms	A	
593.	When acetylene is passed through hot iron tube at 400 °C it gives: **[2011**-88 **Eng]**: (a) Benzene (b) O – xylene (c) Toluene (d) polythene	**A**	
594.	A nucleophile is; **[2010**-141 **MEd]**: (a) Lewis acid (b)Bronsted acid (c)Bronsted base (d) Lewis base	D	
595.	Species in search of the positive charge are called; **[2010**-26 **Eng]**: (a) Reducing agent (b) Nucleophile (c) Bases (d) Electrophile	B	

596.	Which of the following is a nucleophile? **[2011**-136 **MEd]** (a) $AlCl_3$ (b) CN^- (c) H_3O^+ (d) BF_3	B
597.	Which of the following is not a nucleophile? **[2013**-172 **MEd]**; (a) NH_3 (b) HO (c) HC = CH (d) Br	D
598.	Which of the following is not a electrophile? **[2013**-60 **Eng]**: (a) H_{3O+} (b) $Alcl_3$ **(c) CN^-** (d) BF_3	C
599.	Compared to benzene, nitration of toluene takes place at: **[2012**-86 **MEd]**; (a) Slower rate (b) faster rate (c) same rate (d) depends on the conditions	B
600.	The catalyst used in Friedel-craft reaction; **[2012**-126 **Eng]**: (a) Lewis base (b) Lewis acid (c) amphoenc compounds (d) none of these	B
601.	$AlCl_3$ generally behaves as: **[2012**-181 **Eng]**: (a) Lewis acid (b) Bronstead base (c) Bronstead acid (d) Lewis base	A
602.	Benzene reacts with acetyl chloride in the presence of lewis acid forming: **[2013**-68 **MEd]** (a) Chlorobazcre (b) Acotophenone (c) Benzolc acid (d) benzophenone	B
603.	The most reactive compound among the following is: **[2012**-63 **Eng]**: (a) Nitrobenzene (b) Toluene (c) Benzoic acid (d) Benzene	B
604.	The catalytic hydrogenation of benzene yields; 2007-143 **MEd]**: (a) Xylene (b) Cyclohexane (c) Toluene (d) Benzoic acid	B
605.	Why it is so that if aromatic compounds, burned In air, produce a very smoky flame? **[2012-67MEd]** A) Aromatic compound cannot be completely converted into CO_2 and other products during burning B) The available amount of oxygen present in air is not sufficient to completely burn available compound C) Aromatic compound produces compounds on burning that are of black colour D) None of the above	a
606.	When a mixture of Benzene vapours and air is passed over V2O3 at 45o0C, Benzene is oxidized with the rupture of Benzene ring. Identify the product of the reaction; 2005-30 **MEd]**: (a) Carbon dioxide and water (b) Maleic anhydride (c) Succinic anhydride (d) Acetic anhydride	B
607.	Which statement is NOT true about benzene? **2012**-162 **Eng]**: (a) Benzene is a planer molecule with bond angles 120^o (b) It is completely miscible with water (c) It can be converted into a cyclohexane by hydrogenation (d) It can be converted into ethyl a benzene when reacted with ethyl chloride and $AlCl_3$	b
608.	Which of the following products is obtained from benzene is treated with chlorine in the presence of strong ulthaviolet rays? 2005-60 **MEd]** (a)Chlorobenzene (b) O-dichlorobenzene (c)Hexachlorobenzene (d) P-dichlorobenzene	C
609.	Phenol is an ortho-para orienting because the hydroxyl group: **[2011**-138 **Eng]**:	D

(a) increases the electron density at meta position favouringnucleophilic attack
(b) increases the electron density at meta position favouring electrophilic attack
(c) increases the electron density at O/P positions favouringnucleophilic attack
(d) increases the electron density at O/P positions favouring electrophilic attack

No.	Question	Ans	Explanation
610.	Which of the following is ortho-para orienting and ring deactivating? **[2011**-132 **Eng]**: (a) $-Cl$ (b) $-NH_2$ (c) $-OCH_3$ (d)	A	
611.	The Cl atom attached to benzene ring is: 2006-78 **MEd]**: (a) M-directing (b) O-directing (c) O-and p-directing and deactivating (d) O—and p-directing and activating	C	
612.	Which of the following group is considered to have a deactivating effect during aromatic substitution? **[2010**-95 **Eng]**: (a) – OH (b) $-NH_2$ (c) $-CH_3$ (d) –CN	D	
613.	Which of the following species deactivate the Benzene ring when attached to Banzenering. 2009-31 **MEd]**: (a) C_2H_5 (b) SO_3H (c) NH_2 (d) CH_3	B	
614.	Which of following functional groups are deactivating and not ortho, para directing? **[2013**-35, **[2010**-46 **MEd]**: (a) –R (b) –COR (c) $-NH_2$ (d) NR	**B**	
615.	Which one of the following molecules does not contain nitrogen? 2006-26 **MEd]**: (a)Anililne (b)Pyridine (c) Hydrazine (d) Naphthalene	d	
616.	Benzene undergoes substitution reactions more easily than addition reactions because: **[2012**-19 **MEd]** (a) of its cyclic nature (b) of having three double bonds (c) of aromatic character (d) of delocalization of electrons	B	
617.	Which of the following compounds undergoes nitration most readlily? **[2014**-49 **MEd]**: a) Benzene b) Toluene c) Benzoic acid d) Nitrobenzene	B	Substituents on benzene makes it more reactive. Ortho/para directing makes it more reactive except halogens while meta directing makes is less reactive.
618.	Which of the following is a lewis acid? **[2014**-7 **MEd]**: a) CH_3OH b) $AlCl_3$ c) NH_3 d) CH_3OCH_3	**B**	
619.	Which of the following substitutents is an Ortho and Para director and ring deactivating? **[2014**-48 **MEd]**: a) –OH b) $-NH_2$ c) –Cl d) $-OCH_3$	B	
620.	Choose the IUPAC name of the following compound: **[2015**-36 **MEd]**	C	

CH_3
|
$CH_3 — CH — CH — CH = CH_2$

A) 4- Methyl-2-Pentene B) 2- Methyl-3- Pentene C) 2- Methyl-2- Pentene D)4,4-Dirnethyl-2-Pentene

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621. Select alkene of the following hydrocarbons:
[2015-156 **MEd]**
A) $C_5 H_{22}$ B) $C_5 H_{10}$ C) $C_5 H_8$ D) $C_4 H_{10}$

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622. Select cresol out of the following benzene derivatives? — D
[2015-174 **MEd]**

A)

B)

C)

D)

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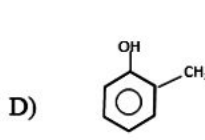
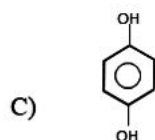
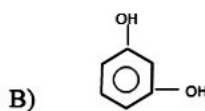
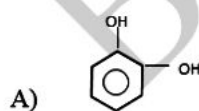
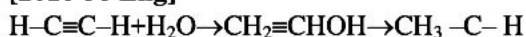

623. What is the suitable catalyst for the reaction given below? — C
[2016-38 **Eng]**
$H–C≡C–H+H_2O \rightarrow CH_2≡CHOH \rightarrow CH_3 –C– H$
(a) Zn, HCl (b) Li Al H_4
(c) $HgSO_{4+}$ H_2 SO_4 (d) Al_2 O_3

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624. What volume of oxygen is required for complete combustion of $5cm^3$ of CH_4 and $5cm^3$ of C_2H_4 in same conditions? — B
[2016-89 **Eng]**
(a) $5cm^3$ (b) $10cm^3$
(c) $25cm^3$ (d) $15cm^3$

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625. Which of the following compounds has acidic hydrogen? — C
[2016-137 **Eng]**
(a) Ethylene (b) 2-butyne
(c) Propyne (d) 3-butadiene

---

626. The correct order of the reactivity of hydrocarbon given below is: — A
[2016-47 **MEd]**
(a) $C_2H_4 > C_2H_2 > C_6H_6$ (b) $C_6H_6 > C_2H_4 > C_2H_2$
(c) $C_2H_4 > C_2H_4 > C_6H_6$ (d)

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627. Select meta directing group of the following? **[2016**-102 **MEd]** — C
(a) –OH (b) – NR_2
(c) –CN (d) –OR

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628. In the $CH_3CH_2C \equiv CH + H_2O \rightarrow ?$ **[2016**-130 **MEd]** — D
(a) $CH_3CHO + CH_3CHO$
(b) $CH_3CH_2CH_2CH_2 – OH$
(c) $CH_3CH_2CH_2COOH$
(d) $CH_3CH_2COCH_3$

CHAPTER-17: ALKYL HALIDES

629. Which is not true about Grignard reagent? — B — Grignard reagent are very stable and can not be isolated from ethereal solution.
[2015-75 **MEd]**
A) They are highly reactive compounds
B) They are very stable compounds & can be isolated easily
C) They have synthetic importance
D) They are represented by general formula RMgX

630. Propene is unsymmetrical molecule the addition of HI will result in the formation of: **[2013**-90 **Eng]**: — A
(a) $H_3C - CH - CH_3$ (b) CH3 CH_2 I
(c) CH_3 CH CH_3 + CH_3 CH_2I (d) $CH_2 - CH - CH_3 + H_2$

631. Choose the correct product of the following reaction: $CH_3CH_2OH + PCl_5 \rightarrow$ **[2013**-107 **Eng]**: — B
(a) $CH_3CI + POCI_3 + H_2O$ (b) $CH_3CH_2CI + POCI_3 + H_2O$
(c) $CH_3CH_2CI + CI + POCI_3 + HCI$ (d) $C_2H_5CI + H_3PO_3$

632. Which of the following reaction show nucleophilic substitution of alkyl halide R–X? 2007-119 **MEd]**: — B
(a) $RX + H_2 \rightarrow RH + HX$
(b) $RX + KCN \rightarrow RCN + KX$
(c) $2RX + 2Na \xrightarrow{Heat} R - R + 2NaX$
(d) $R - X + Mg \xrightarrow{Heat} RMgX$

633. Displacement reaction that proceeds by the SN_2 mechanism are most successful with compounds that are: **[2010**-183 **MEd]**: — D
(a)Neopentyi system
(b) Tertiary compound with no branch
(c) Secondary halldes
(d) Primary compound with no branch at B – carbon

634. Which of the following carbonium ion is morestable? 2009-185, **[2011**-139 **MEd]**: — A
(a) R_3C^+ (b) $R_2\overset{+}{C}H$ c. $R\overset{+}{C}H_2$ (d) CH_3

635. Which of the following compounds comparatively would react rapidly in anSN^2reaction? **[2011**-92 **Eng]**: — C
(a) $(CH_3)_3 Cl$ (b) $(CH_3)_2 CHl$
(c) $CH_3CH_2 l$ (d) $CH_2 = CHl$

636. Methane can be prepared by the reaction of; **[2011**-62 **Eng]**: — d
(a) iodomethane with sodium in dry ether
(b) methanol with conc H_2SO_4
(c) sodiummethanoate with soda lime
(d) reduction of bidomethane

637. The reaction of alkyl halide with ammonia is called. **[2010**-74 **Eng]**: — B
(a)Wurtz reaction (b) Hoffman reaction
(c) Flanklands reaction (d)Friedal craft reaction
:

638. When 2-Bromo-2-methyl propane undergoes unimolecular elimination reaction, the product obtained will be: **[2013**-72 **MEd]** — B
(a) 2-Methyl propane: (b) 2-Methyl propane**:**
(c) 2-Methyl-1 propanol: (d) 2-pentanol

639. The acid – catalyzed dehydration mechanism for alcohol is best deceribed as a / an: **[2011**-112 **Eng]**: — B
(a) E_1 (b) E_2 (c) S_N^1 (d) S_N^2

640. Grignard reagent is prepared by reacting: 2009-02**MEd]** — A
(a) Alkyl halide and Mg (b) Alkane and Mg
(c) Alcohol and Mg (d) Non of them

641. What product is obtained when methyl magnesium chloride reacts withammonia: 2008-31 **MEd]**: — A
(a) Methane (b) Methylamine
(c) Ethylamine (d) Methyl Cloride

642. Formaldehyde give and addition product with methyl magnesium iodide. Which one aqueous hydrolysis gives: 2008-169, **[2011**-95 **Eng]**: — B
(a) CH_3OH (b) C_2H_5OH
(c) $(CH_3)_2CHOH$ (d) …..

643. Ketones on reaction with methyl magnesium iodide will produce: **[2012**-198 **Eng]**: — A
(a) Tertiary alcohol (b) primary alcohol
(c) secondary alcohol (d) All of these

644. 1Select the suitable product when ethylene oxide react with hydrogen bromide: **[2012**-166 **Eng]**: — C
(a) 1-Bromethanol (b) Ethyl bromide (c) 2-Bromo ethanol
(d) Ethylene glycol
:

645. Dry CO_2 is passed through Grignard reagent in the presence of ether as a solvent the inter**MEd]**iate is decomposed with dil HCL which gives the compound: 2008-191, **[2010**-162 **Eng]**: — C
(a) Primary alcohol (b) Acetone
(c) Carboxylic acid (d) Secondary alcohol

646. Which one of the Grignard reaction below could give rise to — C
$CH_3CH_2CH(OH)CH_2CH_3$
2006-02 **MEd]**
(a)Propane and methyl grignard
(b) Methyl ethyl kelone and methyl grignard
(c)Propanaldehyde and ethyl Grignard
(d) None of these

647. Choose the correct option of the following? **[2016**-48 **Eng]**s — B
(a) Ammonia is stronger base than Allphatic primary amines
(b) Aliphatic primary amines are stronger bases than ammonia
(c) Aliphatic primary amines and ammonia have almost equal basic strength
(d) Aliphatic amines are not basic in nature

648. 20 Ethanal reacts with CH3CH2Mg Br the product for**MEd]** is: **[2016**-29 **MEd]** — C
(a) $CH_3CH_2CH_2OH$ (b) $\frac{CH_3}{CH_3} > CHOH$
(c) $\frac{CH_3}{CH_3CH_2} > CHOH$ (d) $CH_3CH_2CH_2\overset{O}{\underset{C}{||}}OH$

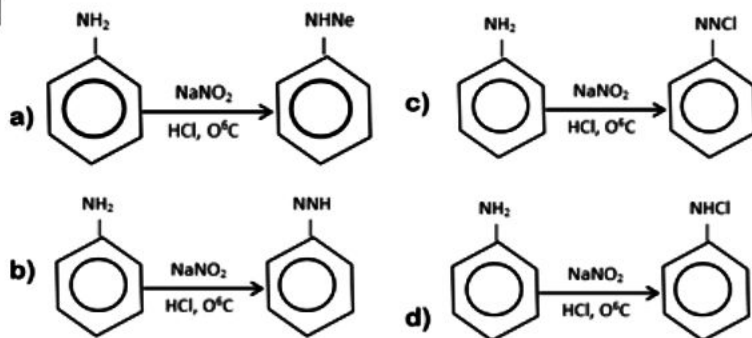
649. 21 Which is not true about Grignard reagent? **[2016**-36 **MEd]** — B
(a) They are highly reactive compounds
(b) They are very stable compounds and can be isolated easily
(c) They have synthetic importance
(d) They are represented by general formula RMgX.

650. 22 Primary amines on treatment with alkyl halide yield; **[2016**-71 **MEd]** — A
(a) Secondary amine (b) Tertiary amine
(c) Quaternary ammonium salt
(d) Mixture of (a), (b) & (c)

651. The compound which can form hydrogen bond with water is: 2017-Med — D
A. CH_3-0-CH_3 B. CH_3-CH_2-OH
C. CH_3 -CH_2-NH_2 D. Non of the above

652.	$OH^-_{(alcoholic)}$ + CH_3 $(CH_2)_2Br$- → Product The nature of OH in the above reaction is: 2017-Med A)Nucleophile B) Lewis base C) Ligand D) All of the above	A
653.	$CH_3CH_2NH_2$ + C_2H_5 -C-C_2H_5 → Product 2017-33 Med A. Schiff's salt B. Diazonium salt C. Amide D.Imine + Amide	A
654.	Which one is a strong nucleophile: 2017- Med A. C_6H_5-O B. H-O^- C.NH_3 D.C_2H_5-O	A
655.	KOH (alcohollic) + CH $(CH_3)_2CH_2Br$ (1). The reactants in the condition given will under go: 2017-Med A. Nucleophilic substitution reaction. B.Elimination reaction. C. Nucleophilic addition. D. None of the above	B
656.	$(CH_3)_3C$-CH_2-Br cannot undergo elimination reaction with alcoholic KOH. It is because. 2018-Eng A)Alcoholic KOH is not a good choice B)It is tertiary alkyl halide C)For elimination strong base is needed D) There is no B-hydrogen in the compound	
657.	Which of the reactant pair you think gives fastest reaction? 2018-Eng A) CH_3-1+F_2 B)CH_3-CI+F_2 C)CH_3-Br +Cl_2 D)CH_3-F+1_2	A
658.	Bromo ethane on reaction with KCN gives compound "X". the compound "X" on reduction with hydrogen (nascent) gives; 2018-Eng A)CH_3 - CH_3 B)CH_3 –CH_2- CH_2 - NH_2 C)CH_3 - CH_2 - COOH D)CH_3 - CH_2 - CH_2 - NO_2	
659.	an alkyne that gives aldehyde on hydrolysis with water under proper condition is: 2018-Eng A)CH_3-C ≡ C-CH_3 B)CH_3- C = CH C)CH_3-CH_2- C =C D)None of the above	
660.	Aqueous KOH causes SN-reaction in alkyl halide. On which of the following alkyl halides KOHaq would like to attack easily; 2018-Med A)CH_3-CH_2-Cl B)CH_3-CH_2-Br C)CH_3-CH_2-F D)CH_3-CH_2-I.	D

CHAPTER-18: ALCOHOLS, PHENOLS & ETHERS

661. Choose the correct reaction

662. Four beakers containing ethanol, ethanol,propanone and phenol B

separately. Aqueous bromine was added to each beaker. A white ppt was produced in one beaker. This beaker contain: 2017-Med

A) Ethanol B) Phenol

C) Ethanal D) Propanon

---

663. Select the correct order in boiling point: 2017- Eng — **D**

A. 1-Butanol < 2-Butanol < 2-Methyl-2-Propanol

B.2-Butanol < 1-Butanol < 2-Methyl-2-Propanol

C.2-Methyl-2-Propanol <1-Butanol < 2-Butanol

D.2-Methyl-2-Propanol < 2-Butanol < 1-Butanol

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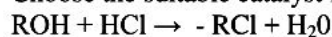
664. Choose the suitable catalyst for the following reaction: 2017-Eng — **B**

$ROH + HCl \rightarrow - RCl + H_20$

A) $AlCl_3$ B) $ZnCl_2$

C) $TiCl_4$ D) $FeCl_3$

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665. Diethyl ether reacts with Acetyl Chloride in the presence of anhydrous $ZnCl_2$ to form: 2017-Eng — **A**

A. $C_2H_5Cl + CH_3\ COOC_2H_5$

B. $CH_2 = CH_2 + CH_3\ COOC_2H_5 + HCl$

C. $C_2H_5\ COOC_2H_5 + Cl_2$

D. None of the above

---

666. Methane Thiol and ethane Thiol is added to the natural gas: 2018-Eng — **C**

A) To make combustion of natural gas very easy

B) To increase the boiling point

C) To detect the gas leakage by smell

D) Both a and c

---

667. The correct product of the complete reduction of propionic acid is; 2018-Eng

$$CH_3\text{-}CH_2\text{-}\overset{\overset{O}{\|}}{C}\text{-}OH \xrightarrow[ether]{LiAlH4}$$

A) $CH_3\text{-}CH_2\text{-}C\text{-}CH_2$

B) $CH_3\text{-}CH_2\ \text{–}CH_2\text{-}OH$

C) $CH_3\text{-}COH$

D) $CH_3\text{-}CH_2\text{-}OH$

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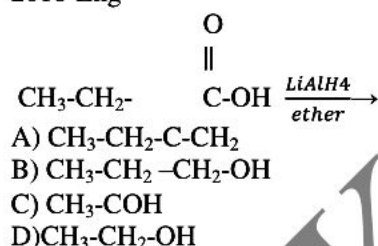
668. 2- Bromopropene on reaction with $C_2H_5S^-$ thio alcohol under goes: 2018-Eng

A) Elimination reaction

B) Substitution reaction

C) No reaction because $C_2H_5S^-$ is a stronger base

D) Addition reaction

---

669. The oxidation number of carbon in $Mg(HCO_3)_2$ is: 2018-Eng — **A**

A) +4

B) -4

C) -2

D) Zero

---

670. The alcohol given $CH_3\text{-}CH_2\text{-}(CH_3)_2\text{-}OH$. If oxidized with a strong oxidizing agent given: 20181-Med — **D**

A) Aldehyde B) Ketone

C) Ether D) None of the above

---

671. The non-carbonyl compound out of the following is: 2018-Med — **B**

A) $CH_3\text{-}CO\text{-}CH3$

B) $C_2H_5\ \text{-}\ \overset{\overset{OH}{|}}{CH}\text{-}CH_3$

C) $CH\ \text{-}\ \overset{\overset{NH_2}{\|}}{C}\text{=}O$

OR
||
D) CH_3 - C=0

No.	Question	Answer
672.	Excess of ethanol is heated with conc: sulphuric acid keeping the temperature 140°C. The product for**MEd** is: **[2015**-116 **MEd]**. **A) $C_2H_5OC_2H_5 + H_2O$** B) $C_2 H_4$ C) $C_2 H_5 OH$ D) $C_2 H_6$	
673.	Ethanol is manufactured by fermentation of starche. The starch conversion to maltose requires the enzyme; **[2011**-155 **Eng]**: (a) zymase (b) invertase (c) diatase (d) all	c
674.	Rectified spirit is: **[2012**-41 **MEd]**: (a) 100% ethanol (b) 95% ethanol (c) 90 % ethanol (d) 35% ethanol	b
675.	Which compounds has heightest B. Point? 2009-08 **MEd]**: (a) C_2H_6 (b) $C_2 H_5 Cl$ (c) CH_3OCH_3 (d) $C_2 H_5 OH$	d
676.	Which one of the following will give an ionic product? **[2012**-173 **MEd]** (a)$CH_3 CH_2 OH + PCl_5 \rightarrow$ (b)$CH_3 CH_2 OH + Na \rightarrow$ (c)$CH_3 CH_2 OH + PCl_3 \rightarrow$ (d) $CH_3 CH_2 OH + 5oCl_2 \rightarrow$	b
677.	6. Mehtanol reacts with sodium. The product for**MEd]** is sodium methoxide and hydrogen gas. **[2013**-144 **Eng]**: $2CH_3OH + 2Na \rightarrow CH_3O Na + Na + H_2 (g)$ In this re action methanol acts as: (a) Weak base (b) Weak acid (c) Strong base (d) Weak oxidizing agent	b
678.	Select the compound that will not be easily oxidized: **[2011**-108 **Eng]**: (a) Primary Alcohol (b) Sec: Alcohol (c) Ter: Alcohol (d) Aldehyde	c
679.	Which one of the following will not undergo dehydrogenation? (a) $CH_3 OH$ (b) $(CH_3)_2 CHOH$ (c) $(CH_3)_3COH$ (d) CH_3CH_2OH	c
680.	Lucas Test is used to detect the presence of: **[2012 [2013-MEd]** (a) Alcohols (b) Phenols (c) Amino acids (d) Carboxylic acids	A
681.	The compound which reacts most readily with lucas reagent is: **[2010-45MEd]** (a) CH_3CH_2Cl (b) $(CH_3)_2 CHOH$ (c) CH_3CH_2OH (d) $(CH_3)_3 COH$	D
682.	Lucas reagent is: **[2011**-98 **Eng]**: (a) $HCl / NaNo_2$ (b) H_2 / Pb (c) $HCl /ZnCl_2$ (d) HCl / HNO_3	C
683.	By reacting phenol with bromine water the product obtained is. 2007-133 **MEd]**: (a) O-brmophenol (b) M-bromophenol (c) P-bromophenol d) 2,4,6-tribromophenol	D
684.	Bakelite is obtained from: **[2012**-63 **MEd]**: (a) Adipic acid and hexamethylenediamine (b) Dimethyl terephalate and ethyl glycol (c) Neoprene (d) Phenol and formaldehyde	D
685.	Choose the compound in which hydrogen bonding is not possible? **[2012**-11 **MEd]** (a) CH_3OCH_3 (b) H_2O (c) CH_3CH_2OH (d) CH_3COOH	A
686.	Ethers are considered as: **[2011**-115 **Eng]**: (a) lewis acids (b) lewis bases (c) both a & b (d) None of these	B

687. $CH_3COCI + 2NH_3 \rightarrow$ B
Considering the above reaction which one is the true product?
[2013-47 **Eng]**:
(a) $CH_3COO\ NH_4$ (b) $CH_3\ CO\ NH_2$
(c) $H_2N\ COO\ NH_4$ (d) CH_3CI

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688. Which of the following compounds will react with methyl magnesium Iodide followed by acid hydrolysis to give ethyl alcohol? D
[2014-19 **MEd]**
a) Ethylene b)Acetone c)Acetaldehyde d) Formaldehyde

---

689. Which of the following compounds does not give iodoform test on reaction with I_2 and NaOH? **[2014**-40 **MEd]**: **D**
a) Propanone b) Ehtanol c) Butanone d) 2-Propanol

---

690. IUPAC name of the compound C
$CH_3-CH-CH_2CH(OH)-CH_3$
|
CH_2
|
CH_3
(a) 4-methyl-3-hexanol (b)Heptanol
(c) 4-methyl-2-hexanol d) 4-ethyl pentanol-2

---

691. Hemiacetal containing both; B
[2015-46 **MEd]**
A) Alcohol and aldehyde functional groups
B) Alcohol and ether functional groups
C) Aldehyde and ether functional groups
D) Alcohol and carboxylic acid functional groups

---

692. Alcohols are weakly acidic with Ka values in the range of: **D**
[2016-47 **Eng]**
(a) 10^{-8} to 10^{-10} (b) 10^{-10} to 10^{-12}
(c) 10^{-12} to 10^{-25} (d) 10^{-16} to 10^{-18}

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693. Grain spirit is: **[2016**-117 **Eng]** **D**
(a) Isopropyl alcohol (b) Isobutyl alcohol
(c) n-propyl alcohol (d) Ethyl alcohol

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694. Lucas reagent is: **[2016**-149 **Eng]**s **D**
(a) H_2/ Pb (b) HCl/ $NaNO_2$
(c) HCl/ $NaNO_3$ (d) HCl/$ZnCl_2$

---

695. **28** Methanethiol and ethanethiol is added to the natural gas: **C**
[2016-179 **Eng]**
(a) To make the combustion of natural gas very easy
(b) To increase the bolling point
(c) to detect the gas leakage by smell
(d) Both (a) & (b

---

696. Which one of the following is carbolic acid? **[2016**-197 **Eng]** C
(a) H_2CO_3 (b) 5% solution of benzoic
(c) 5% solution of phenol
(d) 5% solution lactic acid

---

697. Choose reaction that is not correct? **[2016**-37 **MEd]** D
(a)R C –OH+$SOCl_4 \rightarrow$ RC – Cl + HCl + SO_2
(b) R C –OH+$PCl_4 \rightarrow$ RC – Cl + HCl + $POCl_3$
(c) $2CH_3COOH + P_2O_3 \rightarrow CH_3C–O+ CCH_3+H_2O$
(d) CH_3 C–OH+$C_2H_3Cl_4 \rightarrow CH_3C–Cl+C_2H_3OH$

---

698. Choose reaction that does not require $ZnCl_3$ catalyst: **[2016**-80 **MEd]** **D**
(a) $CH_3CH_2OH + HCl \rightarrow CH_3CH_2Cl + H_2O$
(b) $CH_3CH_2OH + HBr \rightarrow CH_3CH_2Br + H_2O$
(c) $CH_3CH_2OH + HI \rightarrow CH_3CH_2I + H_2O$
(d) Both (b) & (c)

699. Ethoxy ethane when treated with conc: H_2SO_4, it produces: **[2016**-174 **MEd]**
(a) Carbocation **(b) Oxonium ion**
(c) Carbanion (d) Oxalate ion

CHAPTER-19:

CARBONYLE COMPOUNDS 1: ALDEHYDES & KETONES

700. The oxidation of pent-2-one (2-pentanone) with nascent oxygen gives: 2017 Med — C
A)Propanal B) Propanoic acid
C)Ethanoic acid D) Pentanoic acid

701. Alkene+O_3 → Ozonide "Zn+H_20"Propanone + Propanal.The IUPAC name of alkene is: 2017-Med — D
A.Hex-2-ene
B.Hex-3-ene
C .2-methyl pent-1-ene
D .2-methyl pent-2-ene

702. Which test of the following would you suggest to distinguish between the compounds? 2018-Eng
R - C(=O) – H and R - C(=O) - R
A) Baeyer's reagent B)Lucas reagent
C)Tollens reagent D)None of the above

703. Fehling's solution is added to the following compounds. Select the one that will show positive test. **[2015**-76 **Eng]** — B — **Fehling solution react with aldehyde.**
A) CH_3 $COCH_3$ B) CH_3 COC_2 H_5
C) CH_3 CHO D) CH_3 CH_2 C OCH_2 CH_3

704. The reduction of aldehydes and ketones in the presence of zinc amalgam and HO Is ter**MEd]** as: **[2015**-65 **MEd]** — B
A) Grignard reduction B) Clemmenson reduction
C) Wolf-kishner reduction D) Friedel-craft reduction

705. Select the test used for the estimation of glucose in blood and urine? **[2015**-115 **MEd]** — C
A) Tollen's reagent test B) Fehling's solution test
C) Benedict solution test D) All of the above

706. Carbon atom in carbonyl is: 2009-12 **MEd]**: — B
(a) SP hybridized (b) SP^2 hybridized (c) SP^3 Hybridized (d) None of the above.

707. Select the statement which is NOT true about carbonyl group? **[2012**-161 **Eng]**: — A
(a) The three atoms attached to the carboxyl carbon are not in the same plane.
(b) The carbon is carbonyl group is SP^2 hybridized.
(c) The bond angles around carbon attached to three atoms are approximately 120.
(d) The carbonyl group forms resonating structure.

708. The conversion of ethyne to acetaldehyde is carried out: **[2012**-188 **Eng]**: — D
(a) NI 250 °C (b) $HgSO_4$ Fe_2O_3 80 °C
(c) Al_2O_2 Fe_2O_3 150 °C (d) Pd, 70 °C

709. Ketones are prepared by the oxidation with $Na_2Cr_2O_7$ and H_2S0_4 of: **[2012**-194**MEd]** — B
(a)Primary alcohol (b)Secondary alcohol
(c) Tertiary alcohol (d)All of the above

710. Isopeopyl alcohol on oxidation with Na2 Cr2 O7, in the presence of H2 SO4 gives; **[2013**-10 **Eng]**: — C
(a) Acetaldehyde (b) Ethanoic acid
c) Acetone (b) Propanoic acid

711. The σ bond for**MEd]** between carbon and oxygen atoms in aldehyde and ketone is due to the overlap of: **[2012**-93**MEd]** — B
(a) sp^2—sp (b)sp^2—sp^2 (c) sp^3—sp^2 (d) sp—sp

712. Acetaldehyde on oxidation by $Na_2Cr_2O_7/H_2SO_4$ gives; 2007-93 **MEd]**: — A
(a) CH_3COOH (b) C_2H_5OH
(c) OHC.CHO (d) None of the above

713. All of the following tests are used to identify aldehyde except: **[2013**-127 **Eng]**: — D
(a) Tollen's test (b) Fehling test (c) Benedict test (d) Baeyer's test

714. Acetaldehyde on treatment with Fehling's solution forms red precipitate. The color is due to the formation of: 2006-75**MEd]**:, 2005-74, **[2012**-154 **Eng]**: — D
(a) sivler nitrate (b) silver (c) CuO (d) Cu_2O

715. Aldehydes may be distinguished from ketones by the use of: **[2010**-16 **MEd]** — C
(a) Hoffman reagent (b) Grignard reagent
(c)Tollens reagent (d) Cannizaro reagent

716. Metaformaldehyde is a trimer of: **[2012**-82 **Eng]**:
(a) ethanol (b) ethanal (c) Methanal (d) methanol

717. Which of the following will give a positive test with fehling solution? **[2010**-01**MEd]**, **[2011**-122 **Eng]**: — C
(a) acetic acid (b) ethyl acetate
(c) formaldehyde (d) acetone

718. Formaldehyde is used in the manufacture of: **[2013**-77 **Eng]**: — A
(a) Pararosaniline (b) Acetic anhydride
(c) 1,3-Butadien (d) Smokeless powder

719. Reduction of acetaldehyde with H_2/Ni gives: **[2014**-174 **MEd]**: — A
(a) Ethanol (b) Ethanoic acid
(c) Ethane (d) Ethylene

720. Methanal on treatment with Grignard's reagent CH_3MgBr the product for**MEd]** is: **[2016**-199 **Eng]** — A
(a) CH_3CH_2OH (b) CH_3OH
(c) Manganese (d) Iodine

721. The compound Aldehyde hydrazone is: **[2016**-68 **MEd]** — A
(a) $\frac{R}{H} > CH = N - NH_2$
(b) $\frac{R}{H} > CH - NH - O - NH_2$
(c) $\frac{R}{H} > CH - NG - NH_2$
(d) $\frac{R}{H} > CH - O - N = NH$

CHAPTER-20: CARBONYLE COMPOUNDS 2: CARBOXYLIC ACIDS & FUNCTIONAL DERIVATIVES

722. The compound which can not be hydrolysed by water is ; 2017-Med — d

a) $CH_3-CH_2-\overset{O}{\overset{\|}{C}}-Br$

b) $CH_3-\overset{O}{\overset{\|}{C}}-O-\overset{O}{\overset{\|}{C}}\ \ CH_3$

c) $CH_3-CH_2-\overset{O}{\overset{\|}{C}}-NH_2$

d) non of the above

---

723. Choose the True product of the following reaction 2017-Med — B

$CH_3C\equiv N+2H_2O+HCl \rightarrow$

A. $CH_3COOH + NH_3$ B. $CH_3COOH + NH_4Cl$

C) $CH_3COCl + NH_3$ D. $CH\ CONH_2$

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724. The carbonyl group of carboxyl acid does not exhibit the characteristic reaction of aldehyde and ketone due to: 2017- Eng — A

A. The C of carbonyl is less positive

B. The Cof carbonyl is more positive

C. The C of ketone is less porosity

D.Does depend o atom

---

725. Which of the following reactants when react produce ester? 2018-Eng — C

A) CH_3CH_2-OH and PCl_3

B) CH_3COOH and CH_3-O-CH_3

C) C_2H_5.- OH and HCOOH

D) CH_3 OOH and CH_3CHO

---

726. Regarding reactivity of the compounds having carbonyl group. The most reactive compound out of the following is; 2018-Med — C

a) $CH_3-CH_2-\overset{O}{\overset{\|}{C}}-CH_3$

b) $CH_3-\overset{O}{\overset{\|}{C}}-OH$

c) CH_3-C-N

d) all of these

---

727. Select the correct product: — D

R-C $\equiv$ N + H_2O The hydrolysis of Alkyl nitriles in the presence of acid form

(a) R CO NH_2 (b) R CH_2NH_2

(c) R-CJ-NH_2 (d) RCOOH

---

728. What is the name of the carboxylic acid given below? 2017-Med — B

$HOOC(CH_2)_3COOH$

A)Propane dioic acid B) Pentane dioic acid

C) Pentane dicarboxylic acid D) Propane dicarboxylic acid

729. Which one of the following is strongest acid? **[2013**-38, **[2011**-183**MEd]**
(a) FCH_2COOH (b) CH_3COOH
(c) $ClCH_2COOH$ (d) C6H5CH_2COO
A
In Carboxylic acid ,electron withdrawing groups i.e Halogens increase acidity while Electron donating groups decrease acidity.

730. Which is the strongest acid? **[2012**-32'**[2015**-44 **MEd]**
(a) CH_3 COOH (b) Cl_2CH COOH
(c) Cl CH_2 COOH (d) Cl_3 C COOH
D

731. Which of the following carboxylic acids is the strongest?
2009-05 **MEd]**:, **[2010**-25 **Eng]**:
(a) Dichloroacetic acid (b) Chloroacetic acid
(c) Formic acid (d) Acetic Acid
A

732. Which of the following statement is false about the acetic acid?
[2012-76 **Eng]**:
(a) Acetic acid is stronger acid than monochloro-acetic acid.
(b) Acetic acid is weaker acid than trichloro-acetic acid
(c) acetic acid is weaker acid than formic acid
(d) Acetic acid is weaker acid than hydrochloric acid.
A

733. Which of the following is NOT correct in case of carboxylic acids?
2006-71 **MEd]**
(a)they are polar molecules
(b)they form H – bonds
(c)they are stronger than mineral acids
(d)they have higher boiling points than corresponding alcohols.
C

734. Which of the following compounds on treatment with $NaHCO_3$ will liberate $C0_2$?
[2011-125 **Eng]**, **[2012**-149 **MEd]**
(a) CH_3 COOH (b) C_2 H_5 NH_2
(c)CH_3 CO CH_3 (d) CH_3 CH_2 OH
A

735. Which of the following reagent will convert acetic acid into acetyl chloride? **[2012**-47 **Eng]**:
(a) NaCl (b) HCl/$ZnCl_2$ (c) $SOCl_2$ (d) Hg
C

736. What will be the product when PCT_5 reacts with acetic acid?
[2013-55 **MEd]**:
(a) CH_3CI (b) CH_3COCI
(c) CH_3COCI_2 (d) CH_3CH_2COCI
B

737. Acetic acid reacts with thionyl chloride. The product obtained is:
[2013-57 **Eng]**:
(a) $CH_3COCI + SO_2 + HCI$ (b) $CH_3CI + CH_3COCI + SO_2$
(c) $CH_3CO\ CH_3 + SO_2$ (d) None of the above
A

738. Carboxyllc acid reactsreadlly with alcholos in the presence of catalytic amounts of mineral acids to yield compounds called.
[2010-122 **MEd]**
(a)Azides (b)Esters (c) Ketones (d) Ethers
B

739. Acetic acid reacts with methanol in the presence of an acid catalyst to give: **[2012**-68 **MEd]**
(a)Methyl formate (b) Ethyl formate
(c)Methyl acetate (d)Ethyl acetate
C

740. Acetic acid undergoes reduction with Li Al H_4 to give:
[2011-128 **Eng]**:
(a) ethanal (b) ethane (c) ethyne (d) ethanol
D

741. Carboxylic acid forms alcohol in presence of Li AlH_4 and the process is: **[2010**-176 **MEd]**:
(a) Reduction (b) Oxidation
(c) Hydrolysis (d) None of above
A

742. Which is NOT true about amino acids? **[2012**-187 **MEd]** — D
(a) They have two functional groups
(b) They show both acidic and basic characteristics
(c) They are the basic units of proteins(d) They do not exist in solid state

743. All amino acids found in proteins are: **[2012**-181 **MEd]**: — **A**
(a) α-amino acids (b)β-amino acids
(c)Both α and β (d)None of the above

744. Fatty acids are: **[2014**-29 **MEd]**: — B
a) Linsaturated dicorboxylic acid
b) Long chain alkanoic acid
c) Aromatic carboxylic acid
d) Aromatic dicarboxylic acid

745. Saponification of a fat: **[2014**-30 **MEd]**: — A
(a) Always results in the formation of soaps.
(b) Results in the formation of esters.
(c) Results in the formation of waxes.
(d) Results in the formation glycerol and soap.

746. Carbylamine test is given by: **[2014**-31 **MEd]**: — A
a) Primary amines b) Secondary amines
c) Tertiary amines d) All of these

747. The characteristic reaction of carboxylic acid is: **[2014**-39 **MEd]**: — D
a) Electrophillic substitutions b) Nucleophllic substitution
c) Electrophillic addition d) Nucleophillic addition

748. Acetic acid reacts with methyl alcohol in the presence of acid catalyst to give: **[2014**-38 **MEd]**: — D
a) Ethyl formate b) Ethyl acetate
c) Methyl formate d) Methyl acetate

749. Choose reactants whose reaction product is ester: **[2015**-35 **MEd]** — C
A) CH_3 COOH and CH_3OCH_3
B) CH_3 COOH and C_2H_5CHO
C) CH_3 COOH and CH_3 CH_2OH
D) CH_3 COOH and CH_3 $COCH_3$

750. Hydrolysis of ester in the presence of KOH is called: **[2015**-105 **MEd]** — **C**
A) Estrification B) Decarboxylation
C) Saponification D) Neutralization

751. Carboxylic acid contains: 2009-164 **MEd]**:
(a) Hydroxyl group (b) A hydroxyl and carboxyl group
(c) A carboxyl grup (d) A carboxyl and oldehydic group

752. Which of the following reagents may not be used for the oxidation of aldehydes and ketones to carboxylic acids? **[2013**-147 **Eng]**: — **A**
(a) Li AlH_4 (b) $KMnO_4$
(c) $K_2Cr_2O_7$ (d) $Na_2Cr_2O_2$

753. The hydrolysis of an ester proceeds most slowly under the condition of: **[2011**-179 **MEd]**:
(a) High acidity (b) High basicity
(c) Neutrality (d) High temperature

754. Choose reactants whose reaction product is ester: **[2015**-35 **MEd]**
A) CH_3COOH and CH_3OCH_3 B) CH_3COOH and C_2H_5OH
C) CH_3COOH and CH_3CHO D) CH_3COOH and CH_3COCH_3

755. Most of the enzymes start showing activities in the range of PH between: **[2016-17 Eng]** — **b**
a) 2–4 (b) 5–9 (c) 3–5 (d) 10–12

756. Hydrolysis of fats occurs in the mouth and stomach to a slight extent because: **[2016-18 Eng]** — b
(a) Very small amount of Lipase is secreted by the salivary glands
(b) Small amount of lipase is secreted by the salivary glands
(c) No lipase is secreted by the salivary glands
(d) Large amount of lipase is secreted by the salivary glands

757. Which is the correct IUPAC name of the compound given below? **[2016-69 MEd]** — b
(a) Acetophenon (b) Phenylethanone
(c) Phenyl ethanal (d) Phenylacetate

CHAPTER-21: BIOCHEMISTRY

758. Waxes are the esters of fatty acids with high molecular weight. **[2015-06 MEd]** — A
A) Monohydroxy alcohols B) Dihydroxy alcohol
C)Trihydroxy alcohol D) All of the above

759. Oligosaccharides class of carbohydrates contain monosaccharides of about: **[2015-24 MEd]** — C
A)2 to 8 units B) 2 to 9 units
C) 2 to 10 units D) 2 to 11 units

760. Sucrose on hydrolysis yield: **[2015-94 MEd]** — **B**
A) Glucose **B) Glucose and fructose**
C) Glucose and maltose D) Maltose and fructose

761. Lipids are chemically: **2013**-178, **[2012**-15 **MEd]**: — D
(a) Acids (b) Alcohols
(c) Ethers (d) Esters

762. Proteins, carbohydrates and fats form three great classes of foodstuffs commonly called: **[2012-77 MEd]**: — B
(a) Trivirates (b) Triumvirates
(c) Trisvirates (d) All of the above

763. High molecular mass compound was hydrolyzed the product was analyzed and found to be amino acid. The compound is: **[2014-199 MEd]**: — A
(a) Protein (b)Carbohydrate
(c) Lipid (d) Vitamins

764. Polyhydroxy aldehydes or ketones are known as: — A
(a) Carbohydrates (b) Proteins
(c) Lipids ((d) Vitamins

765. Sucrose is considered as: **[2014-198 MEd]**: — B
(a) Monosccharides (b) Disacharides
(c) Polysoccharides (d) None of these

766. Sulpholipids are class of compounds that bonds fatty acids, alcohols and carbohydrates. It contains a: **[2016-19 Eng]** — C
(a) Sulphite group (b) Sulphide group
(c) Sulphate group (d) bisulphite group

767. Secondary structure of proteins is elucidated by which of the following technique? **[2016-28 Eng]** — s
(a) Infrared spectroscopy
(b) NMR spectroscopy
(c) X-ray diffraction technique

(d) All of the above

768.	How much phosphorus is required by an adult man per day? **[2016**-15 **MEd]** (a) 500 mg (b) 400 mg (c) 800 mg (d) 1800 mg	C
769.	Delayed wound healing is caused by deficiency of: **[2016**-120 **MEd]** (a) Zn (b) Fe (c) Co (d) Mn	b
770.	Oligosaccharides are involved in the formation of: **[2016**-167 **MEd](c) Sulphate group** (a) Secreted proteins (b) Blood clotting factors (c) Anti-bodies (d) All of the above	d
771.	The molecules of Maltose sugar is given below, it bears: 2018-Eng A)Ether linkage B)Peptide linkage C)Ester linkage D)Carbon carbon linkage	A
772.	Choose the mineral considered as macronutrient and is essential for human life: 2018-Eng A)Iodine B)Iron C)Zinc D) Calcium.	D

CHAPTER-22: INDUSTRIAL CHEMISTRY

773.	Polyester resin-polyurethane resin is: 2017-Eng A.Hot adhesive B.Multipart adhesive C.One part adhesive D.Contact adhesive	B
774.	Which of the following is not a polymer? **[2013**-144 **Eng]**: (a) Urea (b) Starch (c) Polythene (d) Natural rubber	B
775.	Which of the following statement is NOT true? **[2012**-200 **MEd]**: (a) Natural rubber is hydrocarbon (b) Natural rubber is isoprene (c) Natural rubber is polymer of 1, 3 Butadiene (d) Natural rubber can be volcanized	B
776.	Polymerization is a process of producing: 2009-115 **MEd]**: (a) High molecular weight compounds from monomers (b) Low molecular weight compounds from monomers (c) Inter**MEd]**iate molecular weight compounds form monomers (d) High molecular weight compounds from polymers	A
777.	Which of the following is not a polmer? **[2010**-136 **MEd]**: (a) Plastic (b) Petroleum (c) Starch (d) Natural rubber	A
778.	The widely used PVC is polymerized product of; 2007-49 **MEd]** (a) CH2 = CH2 (b) CH2 = CCl2 (c) ClCH2 = CH2Cl) d) CH2 = CHCl	C
779.	The formation of PVC from vinyl chloride is an example of: 2008-117 **MEd]**: (a) Substitution reaction (b) addition polymerization (c)condensation polymerization (d) condensation reaction	B

780. Which is not correct about polyvinyl chloride? **[2013**-75 **MEd]** B
(a) It is used in large scale production of cable insulator
(b) It is a copolymer
(c) It is a homopolymer
(d) It is used in the manufacturing of pipe.

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781. Styrene is polymerized at high temperature of about 600°C In the presence of a catalyst: **[2013**-94 **Eng]**: A
(a) Iron oxide (b) Platinum gauze
(c) ailadium (d) Nickel

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782. Vinylaeetate monomer is prepared by the reaction of acetaldehyde and acetic-anhydride. The catalyt employed is: **[2013**-78 **MEd]** A
(a) $FeCI_3$ (b) AL_2O_3
(c) V_2O_5 d) Cr_2O_3

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783. Polyamides are class of condensation polymers by a chemical reaction between: **[2013**-87 **Eng]**: C
(a) Monocarboxylic acid and diamines
(b) Dicarboxylic acids and diamines
(c) Dicarboxylic acids and simple amines
(d) All of the above

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784. Which of the following is a condensation polymer? **[2012**-197**MEd]** A
(a) Nylon 6,6 (b) Teflon
(c) Polypropylene (d) Orlon

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785. Choose the correct statement: **[2012**-48 **MEd]**: A
(a) The aliphatic polyamides are generally known as Nylons
(b) The aliphatic polyamides are generally known as Polyester
(c) The aliphatic polyamides are generally known as Epoxy Resins
(d) None of the above

---

786. Nylon-6, 6 is obtained from: **2012**-145 **Eng]**: A
(a) adipic acid and hexamthylenediame
(b) tetrafluoroethylene
(c) vinyl cyanide
(d) vinyl benzene

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787. Which one of the following polymers contains nitrogen? **[2012**-151 **Eng]**: **C**
(a) PVC (b) Teflon
(c) Nylon (d) polypropylene

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788. Super phosphate is made by: 2009-176 **MEd]**: A
(a)the acidulation of phosphate rock
(b) the alkylation of phosphate rock
(c) The alcoholation of phosphate rock
(d) The alkali addition with phosphate rock

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789. Which one is not a nitrogenous fertillzer? **[2013**-85 **MEd]**: B
(a) Ammonium nitrate (b) Triple phosphate
(c) Urea (d) Nitro phosphate

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790. Which is the correct formula of ammonium carbamate? **[2010**-173, 2009-96 D
(a) H_2NCONH_2 (b) NH_4COONH_4
(c) $H_2NCOONH_2$ (d) NH_2COONH_4

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791. The conversion of carbonate to urea is: **[2011**-106 **MEd]**: C
(a) Slow and exothermic (b) Fast and exothermic
(c) Slow and endothermic (d) Fast and endothermic

792. Which is not a raw material for the production of cement? **[2013**-180 **Eng]**: — A
(a) $CoCO_3$ (b) $CaCO_3$
(c) $CaSO_4$ $2H_2O$ (d) Clay

793. The formula CH_3 $(CH_2)_{16}$ COO^-Na^+ represents a member of the class of compound which are known as: **[2010**-72 **MEd]**: — B
(a) Steroids (b) Soaps
(c) Carbohydrates (d) Vitamins

794. Paper is biodegradable material. It produces gas whose emission is environmentally objectionable. Which is that gas? — C
(a) CO_2 (b) SO_2 (c) CH_4 (d) NO_2

795. In glass manufacturing process annealing is done for the prevention of: 2008-51 **MEd]**: — A
(a) Air bubbles (b) Impurities (c) Strain (d) Shining

. Which of the following polymers contain nitrogen? **[2014**-185 **MEd]**:
(a) PVC (b) Terylene (c) Nylon (d) Teflon

796. In auto mobiles ethylene glycol is used to prevent: **[2016**-119 **Eng]**s — D
(a) Freezing of water in cold winter
(b) Boiling of water in hot summer
(c) Drying up radiator
(d) Both (a) & (b)

797. The polymer which contain nitrogen is: **[2016**-168 **Eng]** — D
(a) Polyethene (b) Polyester
(c) Teflon (d) Nylon

798. 25 The main components of lipstick are: **[2016**-152 **MEd]** — D
(a) Mixture of non-volatile oil and solid wax
(b) Mixture of volatile oil and wax
(c) Fats and wax (d) Fates, oil and wax

799. Nylon (6,6) Six carbon atom in each monomer is the example of: 2014-Eng — C
A .Addition polymers B.Substitution polymers
C. Condensation polymers D.Condensation monomers

CHAPTER-23: ENVIRONMENTAL CHEMISTRY

800. If CO_2 level increase from the normal level, what will happen? 2017-Med — B
A. Decrease in sea level B. Increase in sea level
C. Longer winter season D. Daytime will increase

801. Catalytic converter reduces the emission of ; 2017-Med — D
A) Unburnt hydrocarbons B) CO
C) NO D) All of the above

802. What is the colour of oxidizing smog? 2017-Eng — A
A. Reddish brownish grey B.Bluish brownish grey
C.Brownish grey D.Yellow

803. Which one of the following terms is not related to pollution? 2018-Eng — D
A)Noise B)Air
C)Radiation D)None of the above.

804. Which has the lowest temperature? **[2013**-185 **MEd]** — C
(a) Troposphere (b) Stratosphere
(c) Mesosphere (d) Thermosphere

805. Rain water becomes acidic, when the pH-value of rain water becomes. **[2013**-21 **MEd]**: C
(a) Greater than 6 (b) Greater than 6.5
(c) Less than 5.6 (d) Less than 5

806. In lower atmosphere, ozone has adverse effects due to its role in the formation of: **[2013**-114 **Eng]**: D
(a) CO_2 (b) NO_2
(c) Fog (d) Photochemical smog

807. What is the most important source of water pollution in Pakistan. **[2011**-196**MEd]** A
(a) industries (b) transportation
(c) mining industry (d) agricultural and municipal wastage

808. Commonly used coagulant used for the purification of water is: **[2012**-153 **MEd]**: C
(a) $Ca(NO_3)_2$ (b) $MgCl_2$
(c) $Al_2(SO_4)_3$ (d) $Ca(OH)_2$

809. Dunking water should be odorless, tasteless and livefrom turbidity and its pH should range between: **[2013**-22 **MEd]**: B
(a) 6.0 to 7.0 (b) 7.0 to 8.5
(c) 4.5 to 6.0 (d) 8.5 to 9.0

810. Out of the following which treatment is mostly used to kill the disease causing bacteria and other pathogens in water? **[2013**-43 **Eng]**: C
(a) ozonation (b) UV irradiation
(c) chlorination (d) boiling

811. Which metal's presence in fish was responsible for the Minimata disease in Japan? **[2012**-79 **Eng]**: C
(a) Lead (b) Copper
(c) Mercury (d) Cadmium

812. Thermal processing of industrial waste material aims at: **[2013**-82 **MEd]**: C
(a) Burning of waste material in pits
(b) Converting the solid waste into useful products by thermal treatment.
(c) Energy recovery from organic matter prior to its final disposal
(d) Size reduction and compaction by thermal process

813. Hydrolysis of Al_4C_3 gives; **2010**-91 **MEd]**: A
(a) CH_4 (b) C_2H_6
(c) C_3H_4 (d) C_4H_{20}

814. When the nitrates of Na, Li, Ca and Sr were heated strongly in separate containers, all of them gave reddish brown colour EXCEPT the nitrate of: 2009-158 **MEd]**: A
(a) Na (b)Ca
(c)Sr (d) Li

815. Aspirin is produced by heating salicylic acid with: **[2012**-53 **Eng]**: D
(a) Phenol in the presence of Sulphuric acid.
(b) Dentoic anhydride in the presence of phosphoric acid
(c) Methyl alcohol in the presence of sulphuric acid.
(d) Acetic anhydride in the presence of sulphuric acid

816. Acids are classified as monoprotic or polyprotic which of the following is a polypro tic acid? **[2010**-112 **MEd]** d
(a)CH_3CO_2H(aq) (b)HOCl (aq)
(c) $HCHO_2$ (d) H_2CO_3

817. Water is said to be permanently hard when it contains: [2011-143 MEd]: D
(a) carbonates of Ca2+and Mg2+ ions
(b) Bicarbonates of Ca2+and Mg2+ ions

(c) sulphates of Na+and Mg2+ ions
(d) chlorides of Ca2+and Mg2+ ions

818.	Acetic anhydride is obtained with acetyl chloride in the reaction with; 2007-81 MEd]: (a) P2O5 (b) H2SO3 (c) CH3COONa (e) CH3COOH	C
819.	An organic compound after fusion with sodium gives white precipitate when concentrated nitric acid and then silver nitrate solution was added to the filtrate. The compound is likely to be: [2011-123 MEd]: (a) CH3CH2CHO (b) CH3CH2CH2OH (c) CH3CH2COOH (d) CH3CH2CH2Br	D
820.	Warmer water at $4^0 C$ is: 2008-68 MEd]: (a) Lighter (b) Highest (c) Heavier (d) Heaviest	D
821.	The silky finish of mercerized cotton is obtained by treating cotton with a solution of: 2008-150 MEd]: (a)NaOH (b)$NaHCO_3$ (c) Na_2CO_3 (d) $Na_2CO_3.2H_2O$	A
822.	When treated with ammonical cuprous chloride, which of the following forms copper derivates? 2008-92 **MEd**]: (a) C_2H_6 (b) C_2H_4 (c) C_2H_2 (d) C_6H_6	C
823.	The major sources responsible for the presence of NO, N_2O, NO_2 in the atmosphere is / are: **[2014**-192 **MEd]**: (a) Fertilizers (b) Biological decay of deadly organism (c) Fossil fuel combustion d) All of these	**D**
824.	Which statement is correct for three way catalytic converter: **[2016-**132 **MEd]** (a) Reduces emission of unburnt HC's (b) Reduces pollutants (c) Oxidize pollutant like CO (d) All of the above	D

CHAPTER-24: ANAELYTICAL CHEMISTRY

825.	Choose the correct arrangement of the various regions of the electromagnetic spectrum in terms of wave length 2017-Med A. IR > UV Visible > Microwave > Radio wave B. Microwave > IR > Visible > UV > Radio C) Radio wave > Microwave > IR > Visible > UV D) Visible > IR > UV > Microwave > Radio	**C**
826.	Which electronic transition is associated with propanol by absorbing uv/visible radiation? 2018-Eng A) $n \rightarrow \sigma^*$ B) $n \rightarrow \pi^*$ C) $n \rightarrow \pi$ D) $\sigma \rightarrow \sigma^*$	**C**
827.	The nuclei you think is invisible in NMR spectroscopy is: 2018-Med A)N^{14} B)P^{31}	**A**

	C)C^{35} D)C^{13}		
828.	The empirical formula of the compound was found to be CH_20. If the molar mass of the compound is 150g/mol. The molecular formula of the compound is: 2018-Med A) $C_6H_{12}O_6$ B) $C_4H_8O_2$ C) $C_5H_{10}O_4$ D) $C_5H_{10}O_5$	**D**	
829.	Molar extinction coefficient (ε) a constant in Beer-Lambert law is the characteristics of the: [**2015**-25 **MEd]** A) Solute B) Solvent C) concentration D) Al of the above	A	
830.	Which region of electromagnetic spectrum is involved in nuclear magnetic resonance (NMR spectroscopy)? [**2015**-64 **MEd]** A) Micro wave B) Radio wave C) Infrared region D) X-rays	C	
831.	The electronic transition that is involved in the visible region is: [**2015**-104 **MEd]** A) $\sigma - \sigma$ B) $d - d$ C) $\pi - \pi$ D) $\pi - \sigma$	B	
832.	Choose the correct Statement: [**2014**-105 **MEd**]: (a) The most direct and accurate method for determining atomic masses uses mass spectroscopy. (b) The indirect but accurate method for determining molecular masses uses mass spectroscopy. (c) Collision between the electrons and the atoms produces negative ions by absorption of electrons by atoms or molecules. (d) The first application of the mass spectroscopy was the demonstration to detect various isotopes of Argon.	A	
833.	A sample containing aluminum weighing 10.0g yielded 2.0g of aluminum sulphide. What is the percentage of aluminum (atomic mass = 27.0) in the sample? Sulphur (atomic mass = 32.0) [**2011**-153 **MEd]** (a) $\frac{2.0\times100}{10.0}$ (b) $\frac{2.0}{10}\times\frac{2\times27}{150}\times100$ (c) $\frac{2.0}{10.0}\times\frac{27}{1500}\times100$ (d) $\frac{2.0}{10.0}\times\frac{150}{3\times27}\times100$	B	**%age of an Element** = $\frac{\text{Given Mass of Al} \times \text{Af: Mass}}{\text{Given Mass of organic Compounde}} \times \frac{\text{\# of atoms} \times \text{M .Mass of Al}}{\text{M.Mass of organic Compounde}} \times$ 100 = $\frac{2.0}{10.0}\times\frac{2\times27}{150}\times100$
834.	Natural chlorine occurs as a mixture of isotopes if a mixture contains 75% Cl^{35} and 25% Cl^{37} what will be its correct atomic weight? [**2010**-58 **MEd]** (a) 35.50 b) 34.50 (c) 72.00 (d) 70.00	A	Amount of Cl^{35} = $\frac{75}{100} = 0.75$ Amount of Cl^{37} = $\frac{25}{100} = 0.25$ Average atomic weight = (Amount) (At: Mass of 1st Isotope) + (Amount) (At mass of 2nd Isotope) = (0.75) (35) + (0.25) (37) = 26.25 + 9.25 = **35.5**
835.	The atoms of an element having same atomic number but different mass number are called. [**2010**-102 **Eng**]: (a) Isotones (b) Isotopes (c) Isobars (d)Isomers	B	
836.	Benzene molecule have six carbon atoms and six hydrogen atoms the NMR spectrum of benzene will show: [**2016**-138 **Eng]**	D	

	(a) 12-peaks (b) 6-peaks (c) 3-peaks (d) Only a single peak	
837.	The functional group region in infra-red spectrum lies between: **[2016**-30 **MEd]** (a) 500 – 1300cm^{-1} (b) 600 – 1500cm^{-1} (c) 1500 – 4000cm^{-1} (d) 2500 – 3500cm^{-1}	**C**
838.	Chemical shift in NMR spectroscopy is expressed as delta (δ) or tan (t) scale. Choose the correct relationship between δ and t: **[2016**-99 **MEd]** (a) δ = 10 – t (b) δ = 10 + t (c) t = δ – 10 (d) t = 10 – δ	**D**
839.	The water for**MEd]** in the combustion analysis is usually absorbed by: **[2016**-113 **MEd]** (a) Mg $(NO_3)_2$ (b) Mg $(ClO_4)_2$ (c) Mg $(OH)_2$ (d) Mg $(ClO_2)_2$	B
840.	The infrared spectra commonly referred to as IR spectra is usually expressed as: **[2016**-131 **MEd]** (a) Wave l**Eng]**th (b) Wave number (c) Frequency (d) All of the above	**A**
841.	The electronic transition that is involved in the visible region is: **[2016**-144 **MEd]** (a) σ – σ (b) *d – d* (c) π – π (d) π – σ	**B**
842.	Tetramethylsitane (TMS) is added to the compound as standard while carrying out its NMR spectra the TMS is a: **[2016**-09 **Eng]** (a) Nonvolatile compound (b) Less volatile compound **(c) Highly volatile compound** (d) Highly reactive compound	C
843.	**15.** 100% transmission in IR spectroscopy means: **[2015**-145 **MEd]** A) No absorption B) 50% absorption C) 75% absorption D) 100% absorption	**A**

ETEA MEDICAL 2019 BIOLOGY PORTION

1. The genome of influenza virus is made up of — A
a) single stranded RNA
b) double stranded RNA
c)single strand DNA
d) double stranded RNA
ans;a

2. Galantammine hydrobromise is a compound derived from — D
a) cannabis
b) Coca
c) english yew
d) daffodil
ans; d

3. Mark the correct match — B
a) haemophilia –blood cancer
b) SA node – pacemaker
c) ECG-Brain
d) alpha cell- insulin
ans; b

4. Cells which kills cells that display foreign motifs on their surface are; — B
a) platelets
b) cytotoxic t-cells
c) antigens
d) red blood cells
ans; b

5. Chitin is a: — B
a) lipoprotein
b) polysaccharides
c) glycoprotein
d) phospholipids
ans: b

6. Organization of photosynthetic pigment into clusters is ; — B
a) photosyntheises
b) photosystem
c) photosynthetic cluster arrangements
d) calvin system
ans;b

7. Amphibians are poikilotherms, therefore they use to hibernate in — A
a) winter
b) summer
c) autumn
d) spring
ans; a

8. All of the following are macronutrient except — A
a) Cu ions
b) Ca ions
c) Mg ions
d) K ions
ans; a

9. Purkinji fibers are connected with the impulse conducting system of: — A
a)heart
b)brain
c)skin
d)nephron
ans; a
reason ; these fibres are present in the heart and conduct impulse.

10. The alveoli represent total surface area of — C
A)10-30 m
b)30-60 m
c)70-90 m
d)90-110 m
ans; c

11. Some marine fishes possesses salt excreting organs known as; — D
a)thyroid gland
b)pitutary gland
c)adrenal gland
d) rectal gland
ans; d
reason ; rectal glad secretes salts in fishes.

12. Tetanus is infection of — B
a)respiratory system
b)nervous system
c) circulatory system
d)bones and muscles
ans; b
reason ;tetanus is infections f nervous system and symptoms appear in joints and muscles.

13. ______ regulate the body temperature? — A
a) hypothalamus
b) thalamus
c) hippocampus
d) amygdala

14. A man had to face interview, but during his first five minutes before the interview he experiences sweating, increase heart rate and respiration, which hormone is responsible for his restlessness — C
a) adrenocorticotrophic hormone
b) insulin and glucagon
c) epinephrine and norepinephrine
d) aldosterone
ans; c
reason; epinephrine and norepinephrine control stress conditions

15. Hypothalamus connected to pituitary gland via; — B
a) nerves
b)infundibulum

c)blood
d)no connection
ans; b
reason ; hypothalamus connect to pituitary gland through infundibulum

16. 2nd meiotic division in oocyte is completed; — A
a) when oocyte is fertilized by sperm
b) when ovum is discharged from ovary
c) just before fertilization
d) before the onset of mensturization

17. A pure breeding tall plant was crossed to dwarf plant. What would be the probability of "T genotype in F2? — C
a) O b) 0.25
c) 0.5 d) 0.75

18. The number of human spinal nerves is — B
a) 60 b) 62
c) 64 d) 66

19. Diphtheria vaccines is an example of — B
a) Inactivated vaccine b) toxoid vaccine
c) subunit vaccine d) live, attenuated vaccine.

20. Which one of the following items gives its correct total number? — A
a) Cervical vertebrae-7
b) floating ribs in human-3
c) auditory ossicles - 8
d) cranium bones -4

21. find mismatch — B
a) thyroid gland-Ty and T
b) parathyroid gland- calcitonin
e) pancreas-insulin
d) Gonads-Testes and ovaries

22. The simplest form of learning is — D
a) Imprinting b) insight learning
c) Latent learning d) habituation

23. To the end of first trimesters the embryo can now technically describe as a — D
a) Zygote b) infant
c) toddler d) fetus

24. How many pairs of homologous chromosomes are present in Pisum sativum ? — A
a) Seven pairs b) eight pairs
c) nine pairs d) ten pairs

25. 61. The percentage of fresh water on earth is — B
a) 1% b) 3%
c) 5% d) 7%

26. Recombinants contains DNA from — A
a) 2 different sources b) single source
c) 2 same sources d) 3 same sources

27. The inner surface of a kidney has a deep notch called — B
a) Renal pelvis b) Hilus
c) medulla d) Pyramid

28. ______is considered as chief structural and functional unit of nervous system. — B
a) Cell b) neuron
c) nephron d) brain

29. The bacteriophage replicates only inside the — B
a) Animal cell b) bacterial cell
c) fungal cell d) both a and b

30. _______ is stored in animal cells — D
a) Starch b) cellulose
c) sucrose d) glycogen

31. A bacterium which has a group of two or more flagella inserted at one pole of the cell — C
a) Monotrichous b) peritrichous
c) lophotrichous d) amphitrichous

32. The gametophyte of Lycopsida is mainly — D
a) Aerial
b) partial aerial and partially underground
c) underground
d) Photosynthetic

33. Opossum and koala bear belong to sub class — C
a) Prototheria b) cutheria
c) metatheria d) monotremata

34. The form of immunity which inherit from mother — D
a) Active immunity
b) passive immunity
c) acquired immunity
d) innate immunity

35. The least toxic excretory product is — C
a) Ammonia b) urea
c) uric acid d) fatty acid

36. Chemically hormones are — D
a) Carbohydrates b) proteins
c) Steroids d) both b and c

37. DNA polymerase III works always in — B
a) 5'-2' direction b) 5'-3' direction
c)3'-5' direction d) 2'-5' direction

38. The biogas plant is tank which is — B
a) 5-10 feet deep b) 10-15 feet deep
e) 15-20 feet deep
d) 20-25 feet deep

39. Which wavelengths are mainly absorbed by chlorophyll? — A
a) Violet, blue and red
b) green and blue
c) Violet and orange
d) red and indigo

40. For hepatitis B the incubation period is between — A
a) 4 and 20 weeks b) 6 and 20 weeks
c) 2-26 weeks d) 2-6 weeks

41. Sulphur bacteria belongs to sub group of bacteria called — C
a) Beta-proteo bacteria
b) alpha proteobacteria
c) Gamma proteo bacteria
d) delta proteo bacteria

42. Nuclear mitosis occurs in — C
a) Plants b) animals
c) fungi d) Monera

43. Excess glucose is converted in the liver to glycogen in response to the hormone — B
a) Glucagon b) insulin
c) Bile d) both and b

44. During muscles relaxation the calcium ions are — B
a) Released from sarcoplasmic reticulum into Sarcoplasm
b) Forced back from sarcoplasm to sarcoplasmic reticulum
c) Further forced from sarcoplasmic reticulum into sarcoplasm
d) Neither released more nor forced back but remain constant

45. In male luteinizing hormone also known as — B
a) ACTH b) CSH
c) TRF d) MSH

46. Particular amino acid and RNA molecule binds together by the action of an enzyme named — D
a) tRNA synthetase
b) amino tRNA synthetase
c) tRNA ligase
d) aminoacyl tRNA synthetase

47. lipid bilayer makes the membrane differently permeable barrier that allows the transport of — C
a) ionic materials b) polar materials
c) non-polar materials d) Glycoproteins

48. the following are sexual reproduction methods in bacteria except — C
a) transformation b) transduction
c) binary fission d) conjugation

49. lichen is the symbiotic association of a fungus with — B
a) bacteria b) algae
c) other fungus d) animals

50. the possible reason (s) for cyanosis one of the congenital heart disease is — A
a) formation of carboxy hemoglobin
b) the high concentration of oxyhemoglobin
c) low level of CO
d) low level of hemoglobin

51. The deficiency of which micronutrient cause goiter formation? — C
a) Iron b) zinc
c) iodine d) sodium

52. Phosphatases belong to which group of the following? — C
a) Lyases b) ligases
c) hydrolases d) none of the above.

53. The ribosomes responsible for protein synthesis are present in the cell — D
a) Floating in the cytosol
b) Localized in the nucleus
c) Bound to rough endoplasmic reticulum
d) Both a and

54. Enzyme need a primer for the initiation of its function — B
a) RNA polymerase b) DNA polymerase
c) Primase d) Ligase

55. The following histone proteins form a nucleosome complex except — A
a) HI b) H2A
c) H2B d) H3

56. The bond that is formed between two monosaccharide units is called — D
a) ionic bond b) hydrogen bond
c) peptide bond d) Glycosidic bond

57. The optimum pH of enzyme urease is — B
a) 7.8-8.7 b) 7.0
c) 4.5 d) 80

58. Which statement about chlorophyll is not true? — A
a) It contains terminal carbonyl group
b) It contains phyto tail
c) It contain porphyrin ring
d) It contains magnesium

59. In humans the disease symptoms develop during the — A
a) Log phase b) lag phase
c) growth phase d) decline phase

60. Independent gametophyte and sporophyte are found in — A
a) Selaginella b) Polytrichum
c) Ectocarpus d) liverworts

61. Tmesipteris is an example of — C
a) Horsetail b) club mosses
c) psilopsida d) Pteropsida

62. The larva formed during the life cycle of Annelida is — C
a) Glochidium larva b) Bipinnaria larva
c) trochophore larva d) tornaria larva

63. Ebners gland on the dorsal surface of the tongue secrete an enzyme — C
a) Amylase b) Ptyalin
c) Lingual lipase d) both and b

64. Antibodies consists of polypeptide chains — B
a) 2 b)4
e) 6 d) 8

65. Platyhelminthes are — B
a) Bilaterally symmetrical and diploblastic
b) Bilaterally symmetrical and triploblastic
c) radially symmetrical and triploblastic
d) radially symmetrical and diploblastic

66. the scientific name of fresh water mussel is — C
a) mytilus edulis b) loligo pealei
c) anodonta grandis d) anodanta bairdi

67. potamogeton is an example of_______. — C
a) xerophytes b) mesophytes
c) hydrophytes d) halophytes

68. _______stimulates fruits ripening. — C
a) Cytokinin b) abscic acid
c) ethylene d) auxin

69. A condition in which abnormally large volume of urine is produced is — B
a) Polydipsia b) polyuria
c) polyphagia d) polyanypsida

70. The bulbourethral glands produce — D
a) Acidic fluid b) alkaline fluid
c) semen d) mucus

71. HIV destroys a type of defense cell in the body called a helper lymphocyte. — D
a) TD_4 b) T_4
c) C_4 d) CD_4

72. Acetabularia crenulata has ________shaped cap — A
a) Irregular b) umbrella
c) regular d) disc

73. The safranin stain is suitable for — D
a) Fungal hyphae b) Cytoplasm/cellulose
c) blood cells d) Lignin

74. In the human skull the unpaired bones are — A
a) Frontal, occipital, ethmoid and sphenoid
b) Frontal, ethmoid, sphenoid and zygomatic
c) Ethmoid, sphenoid zygomatic and frontal
d) Temporal, Sphenoid, frontal and Ethmoid

75. Functionally___ pairs of cranial nerves are sensory in nature and_____ pairs are mixed in nature and __ are motor in nature. — C
a) 3,4 and 5 b) 4,5 and 3
c) 3,5 and 4 d) 4,3 and 5

76. DNA fingerprinting refer to — B
a) Techniques used for identification of finger prints of individuals
b) Molecular analysis of profiles of DNA samples
c) Analysis of DNA samples using imprinting devices
d) Both a and

77. Oleic acid is a fatty acid with 18 carbon atoms. It breaks down into 9 acetyl groups. It is estimated that these nine acetyl groups would generate ____ATP molecules — D
a) 81 b) 98
c) 101 d) 108

78. Horsetails are included in class — D
a) Pteropsida b) Lycopsida
c) Psilopsida d) Sphenopsida

79. Which one of the following bone is the only moveable portion of the skull? — C
a) Maxilla b) frontal bone
c) Mandible d) Zygomatic

80. Progesterone is secreted by — A
a) Corpus Luteum b) Ripening follicles
c) Uterine epithelium d) fertilized egg

CHAPTER-1: CELL STRUCTURES & FUNCTIONS

81. Proper arrangement of layers in plant cell from inside to outwards is: **[2009]**
(a) Primary wall – Secondary wall – middle lamella
(b) Secondary wall – Primary wall – middle lamella
(c) Primary wall – Middle lamella – Secondary wall
(d) Secondary wall – Middle lamella – Primary wall
Answer: Secondary wall – Primary wall – Middle lamella

82. Polysaccharide cellulose is the building material of: **[2013]**
A) Primarycell-wall
B) Secondary cell-wall
C) Middle lamella
D) Plasma membrane
Answer primary cell wall
Extra Points:-
- primary wall → poly saccharide cellulose
- Middle lamella =>Pectin (Ca Pectate)
- Secondary wall =>Legnin + cellulose

83. The middle lamella of cell-wall is composed of: **[2011]**
(a) Cellulose (b) pectin
(c) Lignin (d) Murein
Answer: pectin
Extra Points:-
- primary wall → poly saccharide cellulose
- Middle lamella =>Pectin (Ca Pectate)
- Secondary wall =>Legnin + cellulose

84. A special protein carrier in plasma membrane is: **[2014]**
(a) Catalase (b) Lipase
(c) Permease (d) Arginase
Answer: permease
Extra Points:-
Permease regulate **diffusion, osmosis & active transport** of ***ionic materials.***

85. A botanist who proposed the cell-theory was: **[2012]**
(a) Schlelden (b) Schwann
(c) Robert Hook (d) Robert Brown
Answer:schleded

86. Nucleus was discovered by: **[2013]**
(a) Waldyar (b) T.H. Margan
(c) RobertBrown(d) Kohler
Answer Robert brown

87. All types of plastids are produced from: **[2010]**
(a) Chloroplastids
(b) Proplastids
(c) Chromoplastids
(d) Leucoplastids
Answer: protoplast

88. Its membranes are the sites where sunlight energy s trapped and where all is formed refers to; **[2005]**
(a) Chloroplast (b) Leucoplast
(c) Chromoplast (d) Cytosol
Answer:clooroplast

89. Potatoe plastids, which store starch, are known as: **[2013]**
(a) Paramylum (b) Amyloplasts
(c) Leucoplasts (d) glycoplasts
Answer:amyloplast
Extra Points:
- Chloroplast are present in plant cell & are self replicating like Mitochondria
- Chromoplast impart colour to the plant other than green & present in petals of flower & in ripened fruits & help in pollination & dispersal of seeds.
- Leucoplast are colourless & are mostly found in underground parts of the plant & store food.

90. Microvillae are also called: **[2013]**
(a) Leaf veins (b) Cristae
(c) Capillaries (d) Leaf midribs
Answer:cristae
Extra Points:-
- Cisternae are found in Endoplasmic Reticulum & Golgi apparatus(Dictysomes).
- Cristae are found in Mitochondria.

91. Smooth endoplasmic reticulum makes: **[2012]**
(a) Enzymes (b) Protein
(c) Sugar (d) Lipids
Answer; lipids

92. A cell fails to detoxity the waste substances produced in it because it does not posses enough: **[2006]**
(a) Lysosomes
(b) Ribosome
(c) Rough endoplasmic reticulum
(d) smooth endoplasmic reticulum
Answer: smooth endoplasmic reticulum
Extra point: RER → proteins
SER→ lipids+ detoxificatio

93. The rough endoplasmic reliculum is involved in the synthesis of; **[2005]**
(a) Proteins
(b) Carbohydrates
(c) Phospholipids
(d) Terpenoids
Answer: proteins
Extra point: RER → proteins

SER→ lipids+ detoxificatio

94. Anthocyanins are various types of colourful pigments present in the: **[2011]**
(a) chloroplasts
(b) chromoplasts
(c) leucoplasts
(d) vacuoles
Answer: vacuoles

95. Plant cells synthesize sugar in the: **[2011]**
(a) Thylakoid (b) grana
(c) stroma (d) crista
Answer: stroma

96. The attachment of two sub units of ribosomes on a single mRNA is controlled by: **[2009-2010]**
a. Mg+ ions b. Na- ions
c. Proteins d. Ribosomal RNA
Answer Mg+ ions

97. Fatty acids are converted into carbohydrates by; **[2010]**
a. Glyoxisome b. Bile juice
c. Pancreatic juice d. Lysosomes
Answer Glyoxisome

98. The attachment of two sub-units of ribosome along mRNA is controlled? **[2009]**
(a) Sodium ions (b) Calcium ions
(c) Potassium ions (d) Magnesium ions
Answer magnesium ions
Ext →Two subunits of ribosomes are attached by Mg + +
→Chlorophyll contain Mg + +
→Haemoglobin contains Fe + +

99. The size of ribosome in prokaryotic cell is: **[2009]**
a. 40s b. 60 s
c. 70s d. 80 s
Answer:70S
Extra points;

Ribosomes	**Smaller unit**	**Larger unit**	**Total size**
Prokaryotic	30 S	50 S	70 S
Eukaryotic	40 S	60 S	80 S

100. Which one of the following is found in plant cells only? **[2006]**
a. Peroxisome
b. Lysosome
c. Glyoxisome
d. Ribosome
answer: peroxisome

101. The growth and reproduction of eukaryotic cell is dependent upon its; **[2005]**
(a) Cytoplasm
(b) Nucleus
(c) Vacuoles
(d) Nuclear pores
Answer:nucleus

102. The chloroplast size is about. **[2015]**
A) 1-2 μM B) 2-4 μM
C) 4-6 μM D) 6-8 μM
Answer: 4-6 μM

Extra points:

Organelle	**Diameter**
Chloroplasts	4 -6 μ m
Nucleus	10 μ m
Ribosomes	20 n m

103. 80–S" ribosome is formed by the combination of: **[2015]**
A) 30S and 40S
B) 70S and 10S
C) 50S and 30S
D) 60S and 40S
Answer60S and 40S
Ext

Ribosomes	**Smaller unit**	**Larger unit**	**Total size**
Prokaryotic	30 S	50 S	70 S
Eukaryotic	40 S	60 S	80 S

CHAPTER-2: BIOLOGICAL MOLECULES

104. Waxes are the esters of fatty acids with high molecular weight. **[2015]**
   a Monohydroxy alcohols
   b Dihydroxy alcohol
   c Trihydroxy alcohol
   d All of the above
   Answer: monohydroxy alcohols

105. Oligosaccharides class of carbohydrates contain monosaccharide's of about: **[2015]**
   A) 2 to 8 units
   B) B) 2 to 9 units
   C) C) 2 to 10 units
   D) D) 2 to 11 units
   Answer 2-10 units

106. Sucrose on hydrolysis yield: **[2015]**
   a) Glucose
   B) Glucose and fructose
   C) Glucose and maltose
   D) Maltose and fructose
   Answer glucose and fructose

Ext

Oligosaccharides	Components
Maltose	Glucose + Glucose
Lactose	Glucose + Galactose
Sucrose	Glucose + Fructose

107. Lactose, maltose and sucrose are the important; **[2005]**
   (a) Polysaccharides
   (b) Disaccharides
   (c) Monosaccharides
   (d) Oligasoccharides
   Answer:disaccharides
   Ext Maltose ,lactose and sucrose are Disaccharides

108. Amount of DNA in bacterial cell is: **[2013]**
   (a) 1% (b) 2%
   (c) 3% (d) 4%
   Answer 1%

109. What is %age of carbohydrates in the mammalian Cell per total cell weight; **[2015]**
   (a) 2 (b) 4
   (c) 8 (d) 18
   Answer:4
   Extra Points:

Contents	Bacterial Cell	Mammalian Cell
Water	70	70
Proteins	15	18
Carbohydrates	3	4
Lipids	2	3
DNA	1	0.25
RNA	6	1.1
Enzymes, Hormones	2	2
Inorganic Ions	1	1

110. Sucrose is considered as: **[2012-2014]**
   (a) Monosaccharide
   (b) Disaccharides
   (c) Polysaccharides
   (d) None of these
   Answer:disachharides

Ext Maltose ,lactose and sucrose are Disaccharides

111. High molecular mass compound was hydrolyzed the product was analyzed and found to be amino acid. The compound is: **[2014]**
   (a) Protein (b) Carbohydrate
   (c) Lipid (d) Vitamins
   Answer:proteins

112. Keratinized Epithelium is found in the: **[2013]**
   (a) Hair (b) Skin
   (c) Bone (d) Muscle
   Answer hair
   Extra Points: • Keratin is present in hair,fur,nails,claws,hooves and outer skin.
   • Collagen is present in skin tendons,ligaments,bones and the cornia of the eye.
   • Both Keratin& Collagen are fibrous proteins.

113. A single molecule of haemoglobin is composed of: **[2013]**
   (a) Three polypeptide chains
   (b) Four polypeptide chains
   (c) Five polypeptide chains
   (d) Six polypeptide chains
   (Answerfour polypeptide chain
   Extra Points:- • Myoglobin has one peptide chain and has tertiary structure.
   • Insulin has two polypeptide chain and has primary structure.
   • Haemoglobin has four peptide chain and has quarternary structure.

114. Conversion of excess glucose into fat is known as: **[2012]**
   (a) Glycolysis
   (b) Lipogenesis
   (c) Ketogenosis
   (d) Glycogenesis
   Answer: lipogenesis

115. Sucrose sugar is considered as: **[2012]**
   (a) Monosaccharide

(b) Oligosacchides
(c) Polysaccharides
(d) All of the above
Answer oligosachharides

---

116. All of the following are polysaccharides except: **[2012]**
(a) Lactose (b) Cellulose
(c) Starch (d) Glucose
Answer glucose

---

117. All cell membranes are composed of: **[2010]**
(a) Proteins (b) Lipids
(c) Lipo protein (d) Cellulose
Answer: lipoprotein

---

118. All of the following are polysaccharides EXCEPT: **[2010]**
(a) Cellulose
(b) Glycogen
(c) Starch
(d) Lactose
Answer; lactose
Ext Maltose ,lactose and sucrose are Disaccharides

Polysaccharide	Found in
Starch	Plants
Glycogen	Animals
Cellulose	Plants
Chitin	Animals

---

119. All of the following structures are proteinous in nature except: **[2009]**
(a) Hooves (b) Hemoglobin
(c) Enzymes (d) Steroids
Answer: steroids

---

120. All of the following are mono nucleotides EXCEPT: **[2009]**
(a) A.M.P (b) A.T.P
(c) A.D.P. (d) F.A.D.
Answer. F.A.D

---

121. All of the following are carbohydrate EXCEPT: **[2009]**
(a) Glycogen (b) Collagen
(c) Starch (d) Cellulose
Answer collagen
Ext

Fibrous proteins
Keratin (hair,nails and outer skin)
Myosin (in muscle cells)
Collagen (skin, ligaments, tendons and bones)

---

122. A coiled hemoglobin is called: **[2009]**
(a) Haemocyonine (b) Haemoprotein
(c) Myoglobin (d) Haemorrhoids
Answer myoglobin

---

123. Peptide bond is formed between: **[2009]**
(a) Hydrogen groups of adjacent amino acids
(b) Functional group of the amino acids
(c) Carboxyl group and Amino group.
(d) Functional group & hydrogen group of adjacent amino acid.
Answer. Carboxyl group and Amino group.

---

124. The enormous diversity of protein molecules is mostly due to the diversity of ; **[2005]**
(a) Amino groups on the amino acids
(b) R groups on the amino acids
(c) Peptide bonds
(d) Amino acids sequences within protein molecules
AnswerR group of the aminoacid

---

125. Which of the following base is not present in RNA; **[2005]**
(a) Thymine (b) Adonine
(c) Guanine (d) Cytosine
Answer: thyamine

---

126. Which of the following is composed of lipids? **[2011]**
(a) Some hormones
(b) Enzymes
(c) Skin tendons
(d) Insulin
Answer:some hormones

---

127. in saturated fatty acids more hydrogen are not accommodated because of **[2017]**
a. presenc of single bonds between carbon atoms
b. presence of double bonds between two carbon atoms
c. presence of double bonds between carbon atoms
d. absence of bond between carbon atoms

answer: presence of single bonds between carbon atoms

CHAPTER-3: ENZYMES

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128. All of the following are co-enzymes except: **[2015]**
a. NAD
b. FAD
c. NADP
d. ADP
Answer: ADP

---

129. The optimum PH of enzyme amylase is: **[2015]**
A) 4.5
B) 5.5
C) 6.1 – 6.8
D) 6.7 – 7
Answer

Ext

Enzyme	Optimum PH
Lipase (stomach)	4 – 5
Lipase (Castor oil)	4.7
Lipase (Pancreas)	8.0
Amylase (Malt)	4.6 – 5.2
Amylase (Pancreas)	6.7 – 7.0
Protease (Stomach)	1
Pepsin	1.5 – 1.6
Invertase	4.5
Catalase	7.0
Urease	7.0
Trypsin	7.8 – 8.7

130. Which of the following is an inactive enzyme without its cofactor? **[2006]**
(a) Coenzyme
(b) Apoenzyme
(c) Holoenzyme
(d) Denatured enzyme
Answer: apoenzymes

131. The enzymes functions are optimum at: **[2014]**
(a) Specific Temperature
(b) Specific PH
(c) Specific co-enzyme
(d) All the above
Answer: all of the above

132. Enzymes are basically: **[2012]**
(a) Proteins
(b) Carbohydrates
(c) Hydrocarbons
(d) None of the above
Answer:proteins

133. All of the following are characteristics of enzymes EXCEPT: **[2009]**
(a) The increase the activation energy
(b) They are specific in action
(c) They possess specific active site
(d) They posses the dimensional shapes
Answer:. They increase the activation energy

CHAPTER-04: BIOENERGETICS

134. Carotenoids pigments are: **[2015]**
A) Yellow, Red, Green, Blue
B) Orange, Yellow, Red, Brown
C) Green, Yellow, Blue, Brown
D) Blue, Red, Green, Yellow
Answer:orange,yellow, red, brown

135. Excited electrons from photo system-II are captured by: **[2015]**
A) PC
B) PQ
C) Cytochromb-b
D) Pentamerous
Answer: PQ

136. 6-NADH can yield: **[2015]**
A) 12-ATP
B) 38-ATP
C) 18-ATP
D) 36-ATP
Answer: 18 ATP

137. The product of light reaction travel from: **[2015]**
A) Cristae to stroma
B) Stroma to grana
C) Grana to cristae
D) Grana to stroma
Answer: grana to stroma

138. Photo-respiration can generate: **[2015]**
A) 4-ATP
B) 36-ATP
C) 32-ATP
D) No-ATP
Answer: no-ATP

139. Dark reaction gets completed by the regeneration of: **[2015]**
A) PGA
B) PGAL
C) RUBP
D) RUBISCO
Answer:RUBP

140. Which is least important in photosynthesis; **[2005]**
(a) Red light
(b) Blue light
(c) Sunlight
(d) Green light
Answer:green light

141. The porduct of light dependent reactions are: **[2014]**
(a) RUBP + ATP
(b) RUBP + PGAL
(c) NADPH + ATP
(d) PGAL + ATP
Answer: NADPH + ATP

142. Chemiosmosis occurs in the: **[2014]**
(a) Grana
(b) Stroma
(c) Thalakoids
(d) InterGrana
Answer: thylakoids

143. Accessory pigments are: **[2014]**
(a) Red-Yellwo-Green
(b) Red-Orange-Blue
(c) Orange-Blue-Green
(d) Red-Orange-Yellow
Answer: red,orange,yellow, brown

144. Light absorbing igments in photosystem first is: [2014]
(a) P 600
(b) P 680
(c) P 700
(d) P 760
Answer:P700

145. "Photo-phosph-rylation" is: **[2014]**
(a) ATP synthesis by food en0020ergy.

(b) ATP synthesis by solar energy.
(c) ATP synthesis by source of water.
(d) ATP synthesis by source of $NADH_2$
Answer:ATP syntheise by solar energy

146. In chlorophyII-b, the porphyrine ring is attached to the: **[2013]-,[2011]**
(a) Methyl group
(b) Carboxyl group
(c) Aldehyde group
(d) Hydroxyle group
Answer: aldehyde group
Ext Chlorophyll a has methyl group(CH3) and formula of C55 H72 O5 N4 Mg
Chlorophyll b has carbonyl group(CHO) and formula of C55 H70 O6 N4 Mg

147. The centre of porphrine ring of haemoglobin is occupied by: **[2013],[2010]**
(a) Magnesium (b) Sodium
(c) Iron (d) Potassium
Answer: iron
Ext →Two subunits of ribosomes are attached by Mg + +
→Chlorophyll contain Mg + +
→Haemoglobin contains Fe + +

148. The pigments of chlorophyll a,b, and carotenoids are present in: **[2013]**
(a) Stroma
(b) Grana
(c) Thalakoid membrane
(d)Crista
Answer:thylakoid membrane

149. .... of mitochondria are the sites of: **[2013]**
(a) Electron transport chains
(b) Photophosphorylation
(c) Krebs cycle
(d) Glycolysis
Answer:electron transport chain

150. Stroma of chloroplasts carries the fixation of: **[2013]**
(a) N_2 (b) O_2
(c) CO_2 (d) NH_3
Answer: CO_2

151. Glycolysis completes with the net gain of: **[2012]**
(a) 2 ATP (b) 3 ATP
(c) 4 ATP (d) 32 ATP
Answer 2 ATP
Ext ATPs produced in non-cyclic photophosporylation are 4
Net gain of ATP in glycolysis 2
The number of ATP formed directly by a single Krebs cycle is 2
Total ATP produced in respiration of glucose is 36

152. The number of ATP formed directly by a single krebs cycle is: **[2012]**
(a) One ATP
(b) Two ATP
(c) 32 ATP
(d) 36 ATP
Answer: one ATP
Ext ATPs produced in non-cyclic photophosporylation are 4
Net gain of ATP in glycolysis 2
The number of ATP formed by a single Krebs cycle is 1
Total ATP produced in respiration of glucose is 36

153. Carotenoid contains: **[2012]**
(a) Carotenes (b) Xanthophyils
(c)Chlorouhyil –C (d)Both A) and B)
Answer: both a and b

154. Stream of chloroplast carries the fixation of: **[2011]**
(a) Nitrogen
(b) Oxygen
(c) Carbon monoxide
(d) carbon dioxide
Answer: carbon dioxde

155. Redox action takes place during the process of: **[2012]**
(a) Respiration (b) Photosynthesis
(c) Growth (d) Both A and B
Answer:both a and b

156. Chlorophyll a and b chiefly absorb: **[2012]**
(a) Violet & blue light
(b) Orange light
(c) Blue —red light
(d) Red, orange light
Answerblue→ red light

157. In chlorophyll "a" The group attached to prophyrine ring is: **[2011]**
(a) hydroxyl group
(b) methyl group
(c) carboxyl group
(d) aldehyde group
Answer: methyl group
Ext Chlorophyll a has methyl group(CH3) and formula of C55 H72 O5 N4 Mg

Chlorophyll b has carbonyl group(CHO) and formula of C55 H70 O6 N4 Mg

158. Chlorophyll is protected from intense light by: **[2011]**
(a) plant hormones
(b) carotenoids
(c) plant-enzyimes
(d) water present in meso;hyll tissue
Answer: carotenoids

159. During cellular respiration $NADH_2$ produces ; **[2010]**
(a) 2 ATP
(b) 3 ATP
(c) 4 ATP
(d) 5ATP
Answer: 3 ATP

160. The center of porphyrine in the head region of hemoglobin is occupied by; **[2010]**
(a) Iron
(b) Magnesium
(c) Sodium
(d) Potassium
Answer: 3 ATP

161. Which of the following is present in the centre of Porpyrine ring of chlorophyll? **[2010]**
(a) Iron
(b) Sodium
(c) Potassium
(d) Magnesium
Answer: magnesium
Ext →**T**wo subunits of ribosomes are attached by Mg + +
→Chlorophyll contain Mg + +
→Haemoglobin contains Fe + +

162. Each molecule of $NADH_2$ entering the electron transport chain produces: **[2009]**
(a) Four ATPs (b) Two ATPs
(c) One ATPs (d) Three ATPs
Answer three ATPS

163. Which one of the following bond is broken first in glycolysis to release the energy? **[2008]**
(a) glycosidic (b) Peptide
(c) ester (d) none of the above
Answer: glycosidic

164. What happens to oxygen in the electron transfer chain in respiration? **[2008],[2005]**
(a) It is released as gas
(b) It forms
(c)CO2
(d) It is used as an electron carier
Answer: it is reduced to water

165. Calvin cycle takes place within: **[2008]**
(a) stroma of chloroplasts
(b) granum of the chloroplast
(c) cytoplasm of the cell
(d) Mitochondria
Answer:stoma of chloroplast
Extra Points: Calvin cycle is also called Dark reaction (C3 cycle)

166. The step in glycolysis in which energy transfer is not involved is: **[2006]**
(a) Glucose phosphate →fructose diphosphate
(b) Fructose diphosphate →DAP
(c) $PGAL \rightarrow PGAP$
(d) $PGAP \rightarrow PGA$
Answer:) Fructose diphosphate → DAP

CHAPTER-5: A CELLULAR LIFE

167. The genome of influenza virus is made up of : **2019-Med**
a) single stranded RNA
b) double stranded RNA
c)single strand DNA
d) double stranded RNA
ans;a

168. The genome of the most animals and higher plants is: **[2014],[2005]**
(a) DNA
(b) RNA
(c) Both DNA and RNA
(d) Either DNA or RNA
Answer: RNA

169. H.I.V contains: **[2011]**
(a) two R.N.As
(b) a single R.N.A
(c) D.N.A and R.N.A
(d) D.N.A
Answer: two RNAs

170. Phage-virus secretes an enzyme "lysozyme" form its: **[2011]**
(a) tail region
(b) head region
(c) neck region
(d) capsule region
Answer: tail region

171. The shape of polio virus is: **[2010]**
(a) Polyhedral shape
(b) Bad shape
(c) Tadpole shape
(d) Golf ball shape
(d) golf ball shape

172. HIV is also known as: **[2010]**
(a) AIDS (b) HAV
(c) HTLV (d) HBV

Answer: HTLV

173. Most favorite host cell of HIV – Virus is: **[2009]**
(a) Lymphocytes (b) RBC
(c) T – Cell (d) B – Cells

Answer T-cell

174. The enzyme "Reverse transcriptase" present in HIV – virus is: **[2009]**
(a) 50 molecules per virion
(b) 40 molecules per virion
(c) 30 molecules per virion
(d) 20 molecules per virion

Answer 30 molecules per virion

175. Phages viruses are usually abundant in the intestine of man and animals because: **[2008]**
(a) Abundant bacteria are present
(b) Abundant water is present
(c) Abundant nutrients are present
(d) They can only live at human bodytemperature

Answer: abundant bacteria are present

176. Genome of which of the following consists of single molecule of DNA? **[2006]**
(a) HAV (b) HBV
(c) HCV (d) HIV

Answer: HBV

177. The genetic material of plant viruses mostly is; **[2005]**
(a) DNA
b) RNA
(c) Both DNA and RNA
(d) Proteins

Answer: RNA

178. identify in which one of the following the genetic information is catalyzed using reverse transcription **[2017]**
a. protein → DNA
b. RNA → DNA
c. DNA → RNA
d. RNA proteins

answer: RNA→DNA

179. which one is not opportunistic disease related to HIV infection **[2017]**
a. destruction of body immune system
b. recurrent pneumonia
c. pulmonary tuberculosis
d. toxoplasmosis

answer: destruction of body immune system

CHAPTER-6: PROKARYOTES

180. The interval between two successive division of bacteria is called: **[2015]**
a) Ecological time
b) Population time
c) Growth time
d) Generation time

Answer: log phase

181. Most disease symptoms appear during. **[2015]**
A) Lag phase
B) Log phase
C) Decline phase
D) Generation time

Answer: log phase

182. Endotoxins are released only when bacteria; **[2015]**
A) Excrete
B) Reproduce
C) Decline phase
D) Stop phase

Answer: decline phase

183. Balantidium coli lives in the intestinal tract of: **[2015]**
A) Pigs and rats
B) Pigs and monkey's
C) Rats and dogs
D) Cats and sheep

Answer pigs and rats

184. Rhizobiurn belong to sub group of bacteria called: **[2015]**
A) Alpha-Protobacteria
B) Beta-Protobacteria
C) Gamma-Protobacteria
D) Delta-Protobacterla

Answer: alpha photobacteria

185. Bacteria living in the gut, forms the association of: **[2015]**
A) Mutualism
B) Peridation
C) Parasitism
D) Commensalism

Answer: mutualism

186. The only human disease caused by VIROID is: **[2015]**
A) Hepatitis A
B) Hepatitis B
C) Hepatitis C
D) Hepatitis D

Answer; hepatitis D

187. Milk sugar is pasteurized by heating for 15 seconds at the temperature of: **[2014],[2005]**
(a) 60 °C (b) 71 °C
(c) 50 °C (d) 80 °C

Answer; 71^{0}C

Ext

Process	Temperature	Time
Pasteurization	72 degree	15 sec

Ultra high temperature	140 degree	3 sec
Sterilization	170 degree	2 hour
Heating	100 degree	10 min

188. When the entire body of a bacterium is covered by flagella, such a bacterium is called: **[2013]**
(a) Atrichous (b) Lopho-trichous
(c) Lampi trichous (d) Peri-trichaus
Answer: peri-trichus

189. Pigeon odour is released from the water bloom of: **[2013]**
(a) Slime mold (b) Water mold
(c) Cyanobacteria (d) Algae ponds
Answer: cyanobacteria

190. Murein cell-wall is composed of: **[2014]**
(a) Sugar and amino acids
(b) Calcium pectate.
(c) Glycoprotein
(d) Peptidoglycan
Answer:sugar and amino acids

191. A cell-wall that is composed of sugar and amino acids is called: **[2013]**
A) Murein
B) Chitin
C) Lignin
D) Pectin
Answer: murein

192. Bacteria maintain their survival by the formation of: **[2013]**
(a) Hormogonia
(b) Akinetes
(c) Endospores
(d) Zygospores
Answer: endospores

193. Which of the following diseases is NOT caused by bacteria? **[2011]**
(a) tetanus
(b) small pox
(c) tuberculosis
(d) diphtheria
Answer: small pox

194. Food is preserved in the form of glycogen by: **[2010]**
(a) Plants
(b) Animals
(c) Cyano bacteria
(d) Both B and C
Answer: both b and c

195. The simplest oxygen producing organisms are: **[2010]**
(a) Photosynthetic bacteria
(b) Autotrophic bacteria
(c) Cyanobacteria
(d) Chlamydomenas
Answer: cyanobacteria

196. Salmonella typhosa is a; **[2010]**
(a) Coccus bacterium
(b) Bacllius bacterium
(c) Spirillus bacterium
(d) Nitrobacterium
Answer: bacillus bacteria

197. The pneumococcus strain used by Griffith in his experiments was; **[2006]**
(a) Lophotrichous
(b) Amphitrichous
(c) Atrichous
(d) Monotrichous
Answer: amphitrichus bacteria

198. All of the following are bacterial diseases except; **[2005]**
(a) Cholera
(b) Tuberculosis
(c) Typhoid
(d) Poliomyelitis
Answer: poliomyleitus

199. Milk is a pasteurizedby heating at; **[2005]**
(a) 100°C
(b) 100°C for 30 min
(c) 71oC for 15min and 62oC for 32 min
(d) 71°C for 32 m in and 62°C for 15 sec
Answer: 71°C for 15min and 62°C for 32 min

200. In which part of the human body the bacteria are normally present in abundance; **[2005]**
(a) Salivary land
(b) Stomach
(c) Intestine
(d) Liver
Answer; intestine

201. Bacteria reproduce asexually by; **[2005]**
(a) Mitosis (b) Meioses (c) Conjugation (d) Fission
Answer: fission

CHAPTER-7: PROTISTA & FUNGI

202. "Foraminifers" helps to determine the, **[2015]**
A) Geological age
B) Ecological time
C) Physiological age
Answer ; geologica age

203. Basidiomycota is also called as **[2015]**
a) Club-mosses
b) Club-fungi
c) Sac-fungi

d) Bread mold
Answer ; club fungi

204. Termites cut wood with the help of enzyme produced by: **[2015]**
A) Trichonella
B) Tripanosoma
C) Trichonymph
D) Trichina
Answer:C) Trichonymph

205. A protest that forms sea-weeds is: **[2015]**
A. Red algae
B. Brown algae
C. Green algae
D. Diatoms
Answer: B) Brown algae

206. Basidiocarp is formed in the: **[2015]**
A) Secondary mycelium
B) Primary mycellum
C) Tertiary mycelium
D) Pathogenic parasites
Answer:C) Tertiary mycelium

207. Best known "Apicomplex" is the: **[2015]**
A) Obligate parasites
B) Facultative parasites
C) Malarial parasites
A) D)Pathogenic parasites
Answer:C) Malarial parasites

208. All of the following belong to phylum Protista except: **[2014]**
(a) Protomycota (b) Gymnomycota
(c) Oomycota (d) Deutromycota
Answer: (d) Deutromycota

209. The cell wall of fungus like protista is composed of: **[2014]**
(a) Chitin (b) Cellulose
(c) Murein (d) Lignin
Answer: (b) Cellulose

210. Nuclear mitosis occurs in the kingdom of: **[2012],[2011]**
(a) Monera (b) Protista
(c) Plantae (d) Fungi
Answer: (d) Fungi

211. Entamoeba belongs Bto the phylum: **[2011]**-77
(a) Sporozoa (b) sarcodina
(c) mastigophora(d) microspora
Answer: (b) sarcodina

212. Carotenoid pigments are present in: **[2010]**
(a) Euglenophyta (b) Pyrrophyta
(c) Chrysophyta (d) Both A and B
Answer: (d) Both A and B

213. The malarial patient feels chill and fever when: **[2010]**
(a) Merozoites increase their population in RBC and burst open the RBC
(b) Sporozoites enter the blood stream
(c) Sporozoites enter the liver cells.

(d) Merozoites come out the liver cell
Answer: (a) merozoites increase their population in RBC and burst open the RBC

214. When an anopheles of mosquito bites a healthy person it injects: **[2008]**
(a) Merozoites (b) Sporozooite
(c) Gametocytes (d) Oocyte
Answer: (b) Sporozooite

215. Plasmodium is found at different stages in man and mosquito. At which stage it can be seen in both the hosts? **[2005]**
(a) Ookinete (b) Male gamete
(c) Oocyst (d) Sporozoite
Answer: (d) Sporozoite

216. The gametophyte of Ulva is; **[2005]**
(a) Haploid (b) Diploid
(c) Triploid (d) Polyploidy
Answer: (b) Diploid

217. An Ascus develops: **[2014]**
(a) 2-Ascospores
(b) 4-Ascospores
(c) 6-Ascospores
(d) 8-Ascospores
Answer: (d) 8-Ascospores

218. Sea-fungi is related to: **[2014]**
(a) Zygomycota (b) Ascomycota
(c) Basidiomycota (d) Deutromycota
Answer: (b) Ascomycota

219. Black bread mold is: **[2014]**
(a) Rhizopus (b) Penicillium
(c) Mucor (d) Yeast
Answer: (a) Rhizopus

220. Cell-well of gram positive bacteria is composed of: **[2014]**
(a) Glycolipids
(b) Glycoproteins
(c) Lipoproteins
(d) Peptidoglycan
Answer: (d) Peptidoglycan

221. Blue green algae, besides chlorophyll also possess another pigment known as: **[2014]**
(a) phycocyanin
(b) phycoerythrin
(c) phycobillirubin
(d) Phycobilliprotein
Answer: (a) phycocyanin

222. Microsporum furfur causes: **[2013],[2010]**
(a) athlete's foot
(b) ring worm ergot

(c) dandruff
(d) ergot
Answer: (c) dandruff

223. Mushrooms belong to: **[2013]**
(a) Zygomycota
(b) Ascomcota
(c) Basidiomycota
(d) Deutetoimycota
Answer: (c) Basidiomycota

224. Penicillin is obtained from: **[2012]**
(a) Algae
(b) Yeast
(c) Mushroom
(d) Mold
Answer: (d) Mold
Ext

Product	Obtained from
Ergotamine	Claviceps purpurae
Pencillin	Pencillium chrysogenum
Cephalosporin	Cephalosporium acremonium
Griseofulvin	Pencillium
Cyclosporine	Fungal product
Yeast	Saccharomyces cerevisiae

225. Rust and smut belong to the phylum; **[2011]**
(a) zygomycota
(b) ascomycota
(c) basidiomycota
(d) deuteromycota
Answer: (c) basidiomycota
Ext

Basidiomycota
Club fungi (club shape basidia)
Primary, secondary & tertiary mycelium
Dikaryotic cell has 2 haploid nuclei
Bsidiocarp is Tertiary mycelium
Muchrooms, puffballs, shelf fungi, rusts and smuts

226. Yeast belongs to the phylum; **[2010]**
(a) Zygomycota
(b) Ascomycota
(c) Basidiomycota
(d) Deutromycota
Answer: (b) Ascomycota
Ext

Ascomycota
Sac fungi
Parasites produces powdery mildow
40 % forms lichen (symbiotic)
Sexual spores called ascocarps
Penicillin drug from pencillium
Yeast

227. Cup-like ascocarp in fungi is: **[2009]**
(a) Apothecium
(b) Perithecium
(c) Hysterothecium
(d) Cleistothecium
Answer: (a) Apothecium

228. In fungi the important adaptation for terrestrial mode of life is disappearance of; **[2005]**
(a) Rhizoids
(b) Stolons
(c) Sporongiophores
(d) Flagellated cells
Answer: (d) Flagellated cells

229. which one of the following locomotory organ would likely to be shortest **[2017]**
a)flageluym
b)celium
c)an extended pseudopodia
d)a pellicle
answer: a cilium

CHAPTER-8: DIVERSITY AMONG PLANTS

230. Galantammine hydrobromise is a compound derived from **2019-Med**
a) cannabis
b) Coca
c) english yew
d) daffodil
ans; d

231. Dicotyledonous flowers are usually: **[2015]**
A) Clmerous
B) Trimerous
C) Tetra,erpis
D) Pentamerous
Answer: D) Pentamerous

232. Smallest gametophyte is present in: **[2015]**
A) Adiantum
B) Funaria
C) Marchantca
D) Angiosperms
Answer: D) Angiosperms

233. Heterospory occur in: **[2015]**
a) Selaginella
b) Equisetum
c) Lycopodium
d) Lepidodendron

Answer: A) Selaginella

234. All of the following are dioecious except: **[2014]**
(a) Ulva
(b) Funaria
(c) Marchantia
(d) Polytricum
Answer: (b) Funaria

235. All of the following are gametophytes except: **[2014]**
(a) Club Mosses
(b) Funaria
(c) Liver-Worts
(d) Horn-Worts
Answer:(a) Club Mosses

236. A spore of Fern plant develops into: **[2014]**
(a) Zygote
(b) Sporophyte
(c) Gametophyte
(d) Prothalus
Answer:(d) Prothalus

237. In angiosperms the megaspore develops into: **[2014]**
(a) Embry-Sac
(b) Embryo
(c) Seed
(d) Male gametophyte
Answer:(a) Embry-Sac

238. A spore of Fern plant develops into: **[2014]**
(a) Zygote
(b) Sporophyte
(c) Gametophyte
(d) Prothalus
Answer:(d) Prothalus

239. Seaginella is the living member of: **[2013]**
(a) Psilopslda
(b) Lycopsida
(c) Sphenopsida
(d) Pterosida
Answer:(b) Lycopsida

240. A sporophyte that depends on gametophytes is: **[2013]**
(a) Adiantum
(b) Pinus
(c) Marchantia
(d) Mustard-plant
Answer:(c) Marchantia

241. Club-mosses are also called; **[2011]**
(a) psilopsida (b) sphenopsida
(c) lycopsida (d) pteropsida
Answer:(c) lycopsida

242. Equesetum is the living member of: **[2010]**
(a) Sphenopslda (b) Psilopsida
(c) Pteropsida (d) Lycopsida
Answer:(a) Sphenopslda

243. All of the following are gametophyte plants EXCEPT: **[2010]**
(a) Liver wort (b) Equisetum
(c) Funaria (d) Polytrichum
Answer: (b) Equisetum

244. All of the following plants possess actinomorphic flowers EXCEPT: **[2010]**
(a) Rose (b) Potato
(c) Apple (d) Pea
Answer: (d) Pea

245. A pollen-grain germinates and develops into: **[2009]**
(a) Prothalus
(b) Sporophyte
(c) Micro-gametophyte
(d) Mega-gametophyte
Answer:(c) Micro-gametophyte

246. All of the following belong to mosses Except: **[2009]**
(a) Funaria (b) Polytrichum
(c) Sphagnum (d) Club-mosses
Answer: (d) Club-mosses

247. Alternation of generations in plants is regarded a mechanism for: **[2008]**
(a) Achieving haploidy
(b) Promoting survival
(c) Producing diploidy
(d) Having no significance
Answer: (b) Promoting survival

248. Class filicinae belongs to "phylum" **[2008]**
(a) Tracheophyta (b) Bryophyte
(c) Thallophyta (d) Embryophyta
Answer:(a) Tracheophyta

249. In bryophytes sterile hair are produced between sex organs to keep them: **[2008]**
(a) Dry (b) Wet
(c) Worm (d) Covered
Answer: (b) Wet

250. Which one of the following is necessary for evolution of seeds? **[2005]**
(a) Introduction of heterospory
(b) Retention of the magaspore within megasporangium
(c) Fertilization of the egg prior to discharge
(d) All of the above
Answer:d) All of the above

251. All of the following are angiosperms except; **[2005]**
(a) Cactus
(b) Amaryllis

(c) Spurge
(d) Firs
Answer:(a) Cactus

252. Size of the flower of chrysanthemum may be enlarged by removing: **[2006]**
(a) All leaves
(b) A few leaves
(c) All branches except one
(d) All floral bud except one.
Answer:(d) All floral bud except one.

253. Consider the following names of some plants; **[2005]**
9I. Grapes
II. Mango
III. Oats
IV. Willow

254. Which of them is the most appropriate for panicle inflorescence?
(a) I, II and III only
(b) I and II only
(c) II and IV only
(d) I and IV only
Answer:(a) I, II and III only

255. In grapes and mangoes, the inflorescence is: **[2011]**
(a) panicle (b) multiparous cyme
(c) capitulum (d) umbel
Answer:(a) panicle

256. Kelps are: **[2016]**
b. Diatoms
c. Red-algae
d. Green-algae
e. **Brown-algae**
Answer: brown algae

257.
ndependent gametophyte and sporophyte are found in:
(a) Liverworts
(b) Tracheophytes
(c) **Ectocarpus**
(d) Mosses
Answer : ectocarpus

258. The flowers come at the same level due to equal size of their pedicels in; **[2007]**
(a) Corymb
(b) Umbel
(c) Catkin
(d) Panicle
Answer:(b) Umbel

259. It looks like a single flower but it is infact an inflorescence called; **[2007]**
(a) Panicle
(b) Typical receme
(c) Compound umbel
(d) Capitulum
Answer: (d) Capitulum

CHAPTER-9: DIVERSITY AMONG ANIMALS

260. All of the following are triploblastic animals except: **[2015]**
a) Amphibian
b) Mollusca
c) Coelentrata
d) Echinodermata
Answer: C) Coelentrata

261. Hermaphrodite phylum is: **[2015]**
A) Annelida
B) Arthropoda
C) Echinodermata
D) Mollusca
Answer: A) Annelida

262. Which of the following animals is not endothermic? **[2015]**
A) Salamander
B) Great white shark
C) Polar bear
D) Butterfly
Answer:A) Salamander

263. The larva of balanoglossus (Hemichordate) is called: **[2015]**
A) Bipinnaria
B) Radiolaria
C) Tornaria
D) Trochophore
Answer: C) Tornaria

Ext

Organism	**Larve**
Echinodermata	Bipinnaria
some annelids [2016]	Trochopora
Hemichordata	Lochidium
Mullusca(balanoglossus)	Glochidiam larva
Amphibian	Tadpole

264. The organs of excretion in crustacean are : **[2015]**
A) Coxal glands
B) Flame cells
C) Malpighian tubules
D) Nephridia
Answer: A) Coxal glands

265. Which of the following animal is included in deuterostome? **[2015]**
A) Mytelus
B) Chaetopterus
C) Penguin
D) Jelly fish
Answer:C) Penguin

266. Which of the following fish have 14 pairs of gill slits? **[2014]**
(a) Dog fish
(b) Lamprey
(c) Cat fish
(d) Ray fish
Answer: (b) **Lamprey**

267. Which of the following is include in deuterestome? **[2014]**
(a) Brittlestar
(b) Scorpion
(c) Chaelopterus
(d) Unio
Answer: (a) **Brittlestar**

268. In octopus, the foot is modified into: **[2014]**
(a) Disc
(b) Arm
(c) Foot
(d) Siphon
Answer: (d) **Siphon**

269. Which of the following animal is included in protostom? **[2014]**
(a) Sea horse
(b) Sea mouse
(c) Seacucumber
(d) Sea lion
Answer: (a) Sea horse

270. How many waling legs are present in arachnids? **[2014]**
(a) 4
(b) 6
(c) 8
(d) 10
Answer:(b) 6

271. Spiders belong to class: **[2013]**
(a) Crustacean
(b) Myriapoda
(c) Arychnida
(d) Hexapoda
Answer:(c) Arychnida

272. Lobsters belong to class: **[2013]**
(a) Myrlapoda
(b) Arychnida
(c) Hexapoda
(d) Crustacean
Answer: (d) **Crustacean**

273. The gills are covered by operculum in; **[2013]**
(a) Bony fishes
(b) Cartllaginous fishes
(c) Lung fishes
(d) Jawless fishes
Answer:(a) Bony fishes

274. Round worms, which have body cavities are partially lined with mesoderm are classified as: **[2011]**
(a) Acaelomate
(b) Ceolomates
(c) Pseudo coelomates
(d) Deuterostomes
Answer:(c) Pseudo coelomates

275. In spiders, the organs that contain the silk glands are called: **[2011]**
(a) Spinnerets
(b) Carapaces
(c) Medriporite
(d) Tube feet
Answer: (a) Spinnerets

276. Crustaceans are the only arthropods that have: **[2011]**
(a) Chitin in their exoskeleton.
(b) chelicetae
(c) 3 pairs of legs
(d 2 pairs of antennae
Answer:(c) 3 pairs of legs

277. Which of the following bird structures are especially adapted to support flight? **[2011]**
(a) Cloacas
(b) Bills
(c) Gizzard
(d) chest muscles
Answer:(d) chest muscles

278. Hydra reproduces asexually by; **[2010]**
(a) Binary fission
(b) Multiple fission
(c) Budding
(d) Regeneration
Answer:(c) Budding

279. Which one of the following animals has no alimentary canal? **[2010],[2005]**
(a) Ascaris
(b) Pin worm
(c) Planaria
(d) Tape worm
Answer: (d) Tape worm

280. Besides mammalian diaphragm is present in; **[2010]**
(a) Birds
(b) Crocodiles
(c) Fishes
(d) Toads
Answer: (b) Crocodiles

281. Which of the following animals is sedentary in adult and active in larval stage? **[2010],[2009]**
(a) Sponge
(b) Leech
(c) Salamander
(d) Grasshopper

Answer:(a) Sponge

282. Which of the following is included in protostome? **[2010]**
(a) Amphioxus
(b) Sea horse
(c) Cheatopterus
d) Sea cucumber
Answer:(c) Cheatopterus

283. Book lungs may be found in which of the following; **[2010],[2009]**
(a) Clam worm
(b) Spider
(c) Silver fish
(d) Leech
Answer: (b) Spider

284. Extra embryonic membranes like amnion and chorion appeared for the first time in. **[2010]**
(a) Fish
(b) Amphibian
(c) Reptiles
d) None
Answer:(c) Reptiles

285. Which of the following is a swimming bird? **[2010]**
(a) Penguin
(b) Ostrich
(c) Hawk
(d) Kiwi
Answer:(a) Penguin

286. Tissue organization is missing in protozoa and found in: **[2009]**
(a) Parazoa
(b) Metazoa
(c) Sporozoa
(d) Monera
Answer:(a) Parazoa

287. The mammals terming connecting link between reptilian and mammals. **[2009]**
(a) Marsupials
(b) Eutherians
(c) Monotremes
(d) Metatherians
Answer: (c) Monotremes

288. Daphnia belongs to: **[2009],[2008]**
(a) Insecta
(b) Annelida
(c) Crustacean
(d) Arachnida
Answer:(c) Crustacean

289. Opossum belongs to: **[2009]**
(a) Metatheria
(b) Eutheria
(c) Theria
(d) Prototheria
Answer:(a) Metatheria

290. Feathers of birds are water proof due to the secretion of: **[2009]**
(a) Sodoreferous glands
(b) Endocrine gland
(c) Preen gland
(d) thymus glands
Answer:(c) Preen gland

291. Metamerism is found in: **[2009]**
(a) Earth worm
(b) Sponges
(c) Snakes
(d) Grass hopper
Answer:(a) Earth worm

292. Nematocysts are found in: **[2009]**
(a) Nematodes
(b) Coelenterates
(c) Annelids
(d) Sponges
Answer: (b) Coelenterates

293. Which of these is a fresh water sponge? **[2008]**
(a) Sycon
b) Leucosolenia
(c) Spongilla
(d) Euplectella
Answer:(c) Spongilla

294. Which of the following expel imperfectly developed embryo out of the body? **[2008]**
(a) prototherions
(b) eutherians
(c) metatherian
(d) all of the above
Answer:(c) metatherian

295. All of the following are nematodes except: **[2008]**
(a) Ascaris
(b) Neries
(c) Trichinella
(d) Guinea worm
Answer: (b) Neries

296. Which one of the following animals lays eggs? **[2007]**
(a) Scally ant eater
(b) Spiny ant eater
(c) Bat
(d) Whale
Answer: **Spiny ant eater**3

297. Which of the following is not present in the fish; **[2005]**
(a) Middle ear
(b) Internal ear
(c) Gills
(d) Fins
Answer :Middle ear

298. Which one of the following has no digestive tube; **[2005]**
(a) Tape worm
(b.) Liver fluke
(c) Planaria
(d) Round worm
Answer; Tape worm

CHAPTER-10: FORMS & FUNCTIONS IN PLANTS

299. Phytochrome "Pfr" absorbs red light of wave length. **[2015]**
A) 600 nrn B) 660 nrn
C) 560 nrn D) 730 nm
Answer:D) 730 nm

300. A hormone that helps in growing seed less grapes , **[2015]**
A) Auxins B) Cytokinins
C) Ethylene D) Gibberellins
Answer:D) Gibberellins

301. Select mineral that is considered as macronutrient. **[2015]**
A) Phosphorus B) Zinc C) Iron D) Iodine
Answer: A) **Phosphorus**

302. Vernalization is the conversion of:
a) Spring variety to the winter variety
b) Winter variety to the spring variety
c) Winter variety to the summer variety
d) Summer variety to the winter variety
Answer: B) Winter variety to the spring variety

303. The following elements H,N,P and Mg are included in: **[2015]**
A) Macronutrients
B) Micronutrients
C) Trace elements
D) Minor elements
Answer: A) Macronutrients

304. Outer wall of Guard cells is: **[2015]**
A) Thin & elastic
B) Thick & elastic
C) Thin & non elastic
D) Thick & non elastic
Answer: A) Thin & elastic

305. The critical day length of a short-day plant is: **[2015]**
A) 11:00 hours
B) 15:00 hours
C) 11 ½ Hours
D) 15 ½ hours
Answer:D) 15 ½ hours

306. Sunken-stomata are found in the leaves of: **[2015]**
A) Hydrophytes
B) Xerophytes
C) Mesophytes
D) Glbberellins
Answer:B) Xerophytes

307. All of the following are micronutrients except: **[2015]**
A) Iron
B) Copper
C) Zinc
D) Magnesium
Answer:D) Magnesium

308. Which one among the following is not macroelement needed by plants; **[2007]**
a. Magnesium
b. Sulphur
c. Iron
d. Potassium
Answer: C. Iron

309. Phloem tissues are composed of: **[2010]**
(a) Trachelds
(b) Trachea
(c) Colleen chyma
(d) Sieve tubes
Answer: (d) Sieve tubes

310. Early fall of leaves and fruits in plants in caused by the deficiency of : **[2011]**
(a) phosphorus
(b) potassium
(c) magnesium
(d) nitrogen
Answer: (a) phosphorus

311. Chlorosis in plants is caused by the deficiency of: **[2011]**
(a) nitrogen
(b) magnesium
(c) potassium
(d) both a and b
Answer: (d) both a and b

312. A set of xylem tissues are: **[2012]**
(a) Vessels, tracheids, parenchyma
(b) Sieve tubes, companion cell, fibers
(c) Parenchyma, sieve tube, vessels
(d) Fibers, companion cells, tracheids
Answer: (a) Vessels, tracheids, parenchyma

313. Opening and closing of stomata is controlled by which of the following factor(s)? **[2006]**
(a) Sugar
(b) pH
(c) Potassium
(d) All of the above
Answer: (d) All of the above

314. Which of the following meristem is responsible for wood formation in plants? **[2008]**

(a) lateral meristem
(b) Apical meristem
(c) Intercalary
(d) None
Answer: (a) lateral meristem

315. Tobacco is a: **[2012]**
A) Long day plant
(b) Short day plant
C) Day neutral plant
(d) Intermediate plant
Answer: (b) Short day plant

316. Florigen is produced by: **[2013]**
A) Flowers
(b) Flower-buds
C) Leaves
(d) Fruits
Answer:C) Leaves

317. All of the following are growth hormones except: **[2011]**
(a) Phytohormones
(b) Gibberllin
(c) Auxins
(d) Cytokinins
Answer: (a) Phytohormones

318. Abcissic acid (ABA) promotes: **[2012]**
(a) Triple response
(b) Sex expression
(c) Flower initiation
(d) Leaf, flower and fruit fall
Answer: (d) Leaf, flower and fruit fall

319. Ripening of fruits can be promoted by: **[2012]**
(a) Gibberellic acid
(b)Indole acetic acid
(c) Florigen
(d) Ethylene gas
Answer: (d) Ethylene gas

320. Gibberellin was isolated from: **[2012]**
(a) An algae
(b) A fungus
(c) A bacterium
(d) A virus
Answer: (b) A fungus

321. Auxins inhibit the growth of: **[2012]**
A)Apical buds
(b)Lateral buds
(d)Parthenocarpy
(d)Root growth
Answer: (b)Lateral buds

322. Growth promoting substance in plant is: **[2012]**
A) F.A.D
(b) Chlorophyll a
(c) I.A.A
(d) ABA
Answer: (c) I.A.A

323. A hormone that prevents senescence in leaves, is: **[2013]**
A) Auxin
(b) Gibberellins
C) Cytokinin
(d) Abscisic acid
Answer:C) Cytokinin

324. A living tissue which in addition to its regular function also provides support to plants is: **[2006]**
(a) Xylem
(b) Collendryma
(c) sclerenchyma
(d) Parenchyma
Answer: (b) Collendryma

325. The growth of the pollen tube through style to the ovary is a type of movement called: **[2008]**
(a) Geotropism
(b) Chemotropism
(c) Hydrootropism
(d) Phototropism
Answer: (b) Chemotropism

326. Pulvinus tissues are present at: **[2013]**
(a) Leaf-tip
(b) Leaf-margin
(c) Leaf-base
(d) Middle-vein
Answer: (c) Leaf-base

327. Growth movement of pollen tube towards the egg is: **[2009]**
(a) Hydrotropism
(b) Chemotropism
(c) Chemotactic
(d) Seismetactic
Answer: (b) Chemotropism

328. The epidermis of the xerophytes is covered with a waxy layer called; **[2005]**
(a) Cellulose
(b) Cuticle
(c) Chitin
(d) Lignin
Answer: (b) Cuticle

329. Opening of flower buds and leaf buds is called; **[2010]**
(a) Epinasty
(b) Thermonasty
(c) Photonasty
(d) Seismonasty
Answer: (a) Epinasty

330. For callus formation, auxin and cytokinin are required in which ratio? **[2017]**
A) Balanced
B) Only cytokinin required

C) Low auxin, very high cytokinin
D) Only auxin

Answer: balanced

CHAPTER-11: DIGESTION

331. In stomach the pepsinogen is synthesized and secreted by: **[2015]**
A) Mucus cells
B) Parietal cells
C) Hormonal cells
D) Chief cells

Answer:D) Chief cells

332. Protein is converted into peptone by which of the following enzyme; **[2007]**
a. Amylase
b. Trypase
c. Lipase
d. Hipase

Answer: b. Trypase

333. Bile is released from the gall bladder by the action of: **[2014]**
(a) Gastrin
(b) Chlecyslokinin
(c) Secretin
(d) Renin

Answer: (c) Secretin

334. In which of the following pharynx opens directly into intestine? **[2014]**
(a) Planaria
(b) Earthworm
(c) Cockroach
(d) Snail

Answer: (a) Planaria

335. Appendix is vestigial in man but may play role in: **[2013],[2009]**
(a) Digestion
(b) Excretion
(c) Immunity
(d) Movement

Answer: (c) Immunity

336. Erepsin acts upon: **[2013]**
(a) Polypeptides
(b) Carbohydrates
(c) Dipeptides
(d) Fats

Answer: (c) Dipeptides

337. Brunner's glands are found in: **[2013]**
(a) Stomach
(b) Duodenum
(c) Ileum
(d) Colon

Answer: (b) Duodenum

338. Which one of the following animals is filter feeder? **[2013]**
(a) Teeth
(b) Sycon
(c) Fresh water muscle
(d) Jelly fish

Answer: (c) Fresh water muscle

339. An organism that adopts saprophytic mode of nutrition during part of its life is called: **[2013]**
(a) Facultative saprophyte
(b) Facultative parasite
(c) Obligate saprophyte
(d) Obligate parasite

Answer: (a) Facultative saprophyte

340. Premature death of paints is caused by the deficiency of: **[2013]**
(a) Magnesium
(b) Iron
(c) Phosphorus
(d) potassium

Answer: (d) potassium

341. Excretion of bile pigments in blood indicates: **[2012]**
(a) Anaemia
(b) Diabetes
(c) Rickets
(d) Jaundice

Answer: (d) Jaundice

342. The amount of energy in food is measured in: **[2011]**
(a) ATP
(b)Calories
(c) ADP
(d) Carbohydrates

Answer: (b)Calories

343. Much of mechanical digestion takes place in the; **[2011]**
(a) oesophagus
(b) mouth
(c) stomach
(d) duodenum

Answer: (b) mouth

344. Early fall of leaves and fruits in plants in caused by the deficiency of: **[2011]**
(a) phosphorus
(b) potassium
(c) magnesium
(d) nitrogen

Answer: (a) phosphorus

345. Chlorosis in plants is caused by the deficiency of: **[2011]**
(a) nitrogen
(b) magnesium
(c) potassium
(d) both a and b

Answer: (d) both a and b

346. An enzyme in gastric juice of many infant mammals that precipitates milk protein is:
(a) Rennin

(b) Pepsinogen
(c) Gastrin
(d) Renin
Answer: (a) Rennin

347. Monotropa is a; **[2010]**
(a) Total parasite
(b) Total saprophyte
(c) Partial parasite
(d) Partialsaprophyte
Answer: (b) Total saprophyte

348. The amount of bile produced by human in liver is: **[2009]**
(a) 1000 ml/day
(b) 2000ml/day
(c) 3000 ml/day
(d) 4000 ml/day
Answer: (a) 1000 ml/day

349. Ammonia is formed during digestion in: **[2009]**
(a) Liver
(b) Stomach
(c) Small intestine
(d) Large intestine
Answer: (a) Liver

350. Teeth adopted for cutting are: **[2008]**
(a) canines
(b) incisors
(c) memoler
(d) molars
Answer: (b) incisors

351. In earthwarm, mucin & enzyme are produced by: **[2008]**
(a) Intestinal sac
(b) Typhlosole
(c) Oesophagus
(d) Pharygeal mass
Answer: (b) Typhlosole

352. Which of the following is Not present in the pancreatic juice? **[2008]**
(a) Amylase
(b) lipase
(c) trypsinogen
(d) insulin
Answer: (c) trypsinogen

353. Which enzyme helps in the digestion of carbohydrate? **[2008]**
(a) Ptyalin
(b) Pepsin
(c) Diastase
(d) Insulin
Answer: (a) Ptyalin

354. Which animal possesses an open circularity system? **[2008]**
(a) Amoeba
(b) Earthworm
(c) Grasshopper
(d) Man
Answer: (c) Grasshopper

355. The role of bacterial population in the large intestine of man is to: **[2006]**
(a) break down of cellulose
(b) synthesize some vitamins
(c) produce intestineal juice
(d) absorb water and mineral salts
Answer: (b) synthesize some vitamins

356. Which one of the following plants feeds on water mites? **[2006]**
(a) Nepenthes
(b) utricularia
(c) Dionea
(d) Drosera
Answer: (b) utricularia

357. Extra cellular digestion occurs in; **[2005]**
(a) Grasshopper and protozoa
(b) Grasshopper and frog
(c) Earthworm and protozoa
(d) Frog and protozoa
Answer: (b) Grasshopper and frog

358. Where does the oesophagus open in the alimentary central of earthworm? **[2005]**
(a) Buccal chamber
(b) Intestine
(c) Rectum
(d) Intestinal caccum
Answer: (b) Intestine

359. The digestion in hydra and planarian is; **[2005]**
(a) Intercellular
(b) Extracellular
(c) Both intracellular and extracellular
(d) None of these
Answer: (c) Both intracellular and extracellular

CHAPTER-12: CIRCULATION

360. Incomplete double circulation is found in: **[2014]**
(a) Aves
(b) Fishes
(c) Amphibians
(d) Mammals
Answer: (c) Amphibians

361. Thalassaemia major is also known as: **[2013]**
(a) Sickle cell anemia
(b) Cooley's anemia
(c) Mycocystic anemia
(d) Nutritional anemia
Answer: (b) Cooley's anemia

362. The valve between left ventricle is called: **[2013]**
(a) Semi lunar valve
(b) Bicuspid valve
(c) Tricuspid valve
(d) Pulmonary valve
Answer: (b) Bicuspid valve

363. The valve between right atrium and right ventricle is called: **[2011],[2006]**
(a) Bicuspid valve
(b) Tricuspid valve
(c) Pulmonary valve
(d) Semi lunar valve
Answer: (b) Tricuspid valve

364. Largest lymphatic duct is the: **[2012]**
(a) Abdominal duct
(b) Thoracic duct
(c) Femoral duct
(d) Subclavian duct
Answer: (b) Thoracic duct

365. The diameter of human capillary is: **[2012]**
(a) 5 microns
(b) 6 microns
(c) 7 microns
(d) 8 microns
Answer: (c) 7 microns

366. The interval of pace maker signals from S.A.N to AV.N is: **[2012]**
(a) 01 second
(b) 0.1 second
(c) 02 seconds
(d) 0.2 second
Answer: (b) 0.1 second

367. which of the following has four chambered heart? **[2010]**
(a) Lizard Lizard
(b) Turtle
(c) Crocodile
(d) Frog
Answer: (c) Crocodile
Answer: (b) Polycythemia

368. In fishes, the heart pumps: **[2009]**
(a) Pure blood to the body
(b) Impure blood to the body
(c) Pure blood to the gills
(d) Impure blood to the gills
Answer: (d) Impure blood to the gills

369. RBCs are destroyed in the liver while WBCsare destroyed in: **[2009]**
(a) Plasma
(b) Liver
(c) Inside various cells of body
(d) Outside of the blood stream
Answer: (c) Inside various cells of body

370. Two chamber heart is found in: **[2008]**
(a) leopard
(b) fish
(c) crocodile
(d) none of the above
Answer: (b) fish

371. Which one of the following animals possesses an open circulatory system. **[2005]**
(a) Amoeba
(b) Earthworm
(c) Grasshopper
(d) Man
Answer: (c) Grasshopper

372. Pumping denser blood causes the heart to be strained and waste products become concentrated in the body. What is the cause of these problems? **[2005]**
(a) Excess of water
(b) Deficiency of mineral
(c) Deficiency of oxygen
(d) Dehydration
Answer: (d) Dehydration

373. The blood flow in milliliters/ minute during exercise to the skin is: **[2015]**
A) 1500 ml
B) 1600 ml
C) 1800 ml
D) 1900 ml
Answer: D) 1900 ml

Chap no 13. Immunity

374. Mark the correct match **2019-Med**
a) haemophilia –blood cancer
b) SA node – pacemaker
c) ECG-Brain
d) alpha cell- insulin
ans; b

375. Cells which kills cells that display foreign motifs on their surface are; **2019-Med**
a) platelets
b) cytotoxic t-cells
c) antigens
d) red blood cells

376. ans; b

377. For which purpose myeloma cells (cancerous B.lymphocytes) are used in the production of monoclonal antibodies? **[2017]**
A) Increased rate of cell division
B) Immunization with antigen
C) To avoid contamination
D) as nutrients in media
answer: immunization with antigen

378. Anti bodies are produced by: **[2011]**

(a) red blood cells
(b) platelets
(c) B-lymphocytes
(d) Hormones
Answer: (c) B-lymphocytes

379. The inherit form of immunity through mother's milk is the: **[2011]**
(a) active immunity
(b) Innate immunity
(c) passive immunity
(d) Acquired immunity
Answer: (b) Innate immunity

380. A non specific defence reaction to tissue damage caused by injury or infection is known as: **[2011]**
(a) active immunity
(b) the inflammatory response
(c) passive immunity
(d) Acquired immunity
Answer:b) the inflammatory response

381. The protein that helps other cells resist viral infection is; **[2011]**
(a) Penicillin
(b) histamine
(c) interferon
(d) antigens
Answer: (c) interferon

382. Blood cells are produced by:
[2006]
(a) Liver
(b) Spleen
(c) Bone marrow
(d) Heart
Answer: (c) Bone marrow

383. Increased production of RBCs is called:
[2010]
(a) Leukaemia
(b) Polycythemia
(c) Edema
(d) Anemia

CHAPTER-14: RESPIRATION

384. Myoglobin is found in: **[2013]**
(a) Bone
(b) Connective tissue
(c) Muscles
(d) Cartilage
Answer: muscles

385. The rate of breathing of a child of 5 years is about: **[2011]**
(a) 44 times / minute
(b) 40 times / minute
(c) 25 times / minute
(d) 20 times / minute
Answer: 25 times per minute

386. B.C.G vaccines are usually given to:
[2012]
A) Children
(b) Adults
(c) Special persons
(d) All of the above
Answer: children

387. Following nasal passages are composed of cartilage except: **[2012]**
(a) Trachea
(b) Bronchus
(c) Bronchieoles
(d) Tracheoles
Answer: bronchioles

388. Myoglobin combines with:
[2012]
(a) Four oxygen molecules
(b) Three oxygen molecules
(c) Two oxygen molecules
(d) One oxygen molecule
Answer: one oxygen molecules

389. Lungs are ______ in origin.
[2014]
(a) Ectodermal
(b) Endodermal
(c) Mesodermal
(d) Preformed
Answer: endodermal

390. Nicotine in tobacco:
[2011]
(a) decreases the heart rate

(b) decreases blood pressure
(c) block the transport of oxygen
(d) paralyzes cilia
Answer: block the transport of oxygen

391. Smaller the animal; **[2010]**
a) More the rate of respiration
(b) Less the rate of respiration
(c) Rate of respiration has nothing to do with size of animal
(d) None of these
Answer: more the rate of respiration

392. Alveoli are absent in: **[2009]**
(a) Fishes
(b) Amphibian
(c) Birds
(d) Mammals
Answer: birds

393. If we cover the lateral sides of the Gross-hopper with wax. The system most likely to be affected will be: **[2008]**
(a) digestive
(b) Circulatory
(c) respiratory
(d) Excretory

Answer:respiratory

394. Photorespiration accurs when: **[2006]**
(a) stomata are opened
(b) day is humid
(c) concentration of CO_2 inside leaf is high
(d) Concentration of O_2 inside leaf is high
Answer: Concentration of O_2 inside leaf is high

395. The process responsible for energy production in animals is: **[2005]**
(a) Photosynthesis
(b) Digestion
(c) Respiration
(d) Circulation
Answer: respiration

396. In hydra, planaria and earthworm the exchange of gases occur through the; **[2005]**
(a.) Lungs
(b) Gills
(c) Trachea
(d) General body surface
Answer: general body surface

397. Amount of O_2 carried by red blood cells is: **[2015]**
A) 77%
B) 90%
C) 87%
D) 97%
Answer: 97%

398. The oxygen carrying capacity of haemoglobin in humans when the blood is 100% oxygenated is: **[2014]**
(a) 19.4 ml
(b) 19.6 ml
(c) 20 ml
(d) 21 ml
Answer: 20 ml

399. Which of the following ions play important role in the transport of carbon dioxide? **[2014]**
(a) Sodium
(b) Potassium
(c) Bicarbonate
(d) Chloride
Answer: bicarbonate

400. Percentage of CO2 carried by plasma is: **[2016]**
(a) 5%
(b) 6%
(c) **7%**
(d) 8%
Answer: 7%

401. 18. Otitis media is an inflammation of which part of the body? **[2017]**
A) A)Brain
B) B)Middle ear
C) Lungs
D) Urinary tract
Answer: middle ear

CHAPTER-15: HOMEOSTASTISIS

402. A condition of excessive thirst due to diabetes is called: **[2015]**
A) Polyuria
B) Glycusuria
C) Polyphagia
D) Polydipsla
Answer: polydipsia

403. Which of the following animals is not endothermic? **[2015]**
A) Salamander
B) Great white shark
C) Polar bear
D) Butterfly
Answer: slamander

3. The birds excrete: **[2013]**
(a) Ammonia
(b) Urea
(c) Uric acid
(d) Acetic acid
Answer: uric acid

404. Surplus amino acid in the body are broken down to form urea in: **[2012]**
(a) Spleen
(b) Kidneys
(c) Liver
(d) Pancreas
Answer: liver

405. Which of the following represent the bile salts? **[2012]**
(a) Bilirubin
(b) Biliverdin
(c) Hemoglobin
(d) Both A) and B)
Answer: both a and b

406. The least toxic excretory product is: **[2012]**
(a) Ammonia
(b) Urea
(c) Uric acid
(d) Fatty acid\
Answer: uric acid

407. Malphigian tubules convert nitrogenous waste into; **[2011]**
(a) urine
(b) ammonia
(c) uric acid
(d) urea
Answer: urea

408. When the kidney fails to form urine the condition is called. **[2010]**
(a) Nephritis
(b) Nephrosis
(c) Ptosis
(d) Anuria
Answer: aneuria

9. Urea formation occurs in: **[2010]**
(a) Kidney
(b) Liver
(c) Spleen
(d) Lungs
Answer: liver

409. Which one is isotonic to the surrounding seawater? **[2009]**
(a) Bony fishes
(b) Shark
(c) Carp
(d) Paramecium
Answer: carp

410. The major and immediate nitrogenous waste product of protein metabolism is: **[2008]**
(a) urea
(b) uric acid
(c) creatinine
(d) Ammonia
Answer: ammonia

411. Which one of the following is homoeothermic animal? **[2008]**
(a) uromastrix
(b) salamander
(c) sea horse
(d) kangaroo
Answer: kangroo

13. Lithrotripsy is a technique to: **[2006]**
(a) Remove kidney stones without surgery

(b) Remove kidney stones with surgery
(c) Treat kidney with medicines
(d) Remove appendix
Answer: remove kidney stones without surgery

412. The glucose is reabsorbed by the; **[2005]**
(a) Proximal convoluted tubule of Nephron
(b) Distal convoluted tubule of Naphron
(c) Glumerulus
(d) Bowman,s capsule
Answer: proximal convoluted tubules of nephrons

413. Each malpighian tubule of grasshopper is an out growth from beginning of: **[2005]**
(a) Haemocoel
(b) Nephridopore
(c) Urinary tubeles of kidney
(d) Proctodaeum
Answer: proctoderm

414. The number of cortical nephrons are: **[2016]**
(a) 70–80%
(b) 80–90%
(c) 60–70%
(d) 60–80%
Answer: 70-80%

415. Each kidney of human being is weighing about: **[2016]**
(a) 140 grams (b) 160 grams (c) 130 grams
(d) 150 grams
Answer: 150 gm

CHAPTER-16: SUPPORT & MOVEMENT

416. The number of vertebrate in coccyx are; **[2005]**
(a) 2
(b) 3
(c) 4
(d) 5
Answer: 4

417. The bone dissolving cells are called: **[2014]**
(a) Osteoclast
(b) Osteoblasts
(c) Osteocytes
(d) Fibroblast
Answer: osteoclast

418. Contraction can be sustained for a long period of time by: **[2013]**
(a) Skeletalmuscles
(b) Smooth muscles
(c) Cardiacmuscles
(d) All of the above
Answer: smooth muscles

419. Bone is surrounded by a membrane called: **[2013]**
A) Perichondrium
(b) Prostomium
(c) Perlmyclum
(d) Periostium
Answer: peristtinum

5. The colour of bone marrow is: **[2012]**
A) Red
(b) Yellow
(c) Orange
(d) Both A) and B)
Answer: both a an b

420. Fatigue free muscles are: **[2012]**

(a) Striped
(b) Unstriped
(c) Cardiac
(d) Triceps
Answer: cardiac

421. A non-connective tissue is: **[2012]**
(a) Areolar tissue
(b) Tendon
(c) Neuron
(d) Ligament
Answer: neuron

422. Regeneration of cartilage is carried on by: **[2012]**
(a) Collagenous fibers
(b) Blood vessels
(c) Perichondrium
(d) Matrix
Answer: perichondrium

423. In human being, the number of cranial nerves are; **[2012]**
(a) 8 pairs
(b) 10 pairs
(c) 12 pairs
(d) 3l pairs
Answer: 12 pairs

424. Bicep muscle is attached to the humerus by: **[2012]**
(a) Tendon
(b) Ligaments
(c) Elastic fibers
(d) Areolar
Answer: tendon

425. Process of bone formation is called: **[2012]**
(a) Calcification
(b) Chondrification
(c) Decaleification
(d) Ossification
Answer: ossifiation

426. A network of tubules that runs through compact bone is called the: **[2011]**
(a) Haversian canal
(b) periosteum
(c) marrow
(d) joint
Answer: haverian canal

427. Heart muscles are called: **[2010]**
(a) Smooth muscels
(b) Myogenic muscles
(c) Striated muscles
(d) Skeletal muscles
Answer: myogenic musces

428. The human sacrum consists of how many …. **[2008]**
(a) Two
(b) Three
(c) four
(d) five
Answer: five

429. Which of the following group of animals run very fast? **[2008]**
(a) Digitgrade
(b) Unguligrade
(c) Bipedal
(d) Plantigrade
Answer: digitgrade

430. Bones are held together of the joints by: **[2008]**
(a) Tendons
(b) smooth muscles
(c) Ligaments
(d) Nerves
Answer: ligaments

431. Organs of locomotion in earth worm are: **[2006]**
(a) Papillae
(b) Setae
(c) Pseudopodia
(d) Cuticle
Answer: satea

432. The cartilage present in trachea is: **[2006]**
(a) Fibrous
(b) Hyaline
(c) Elastic
(d) Neurotic
Answer: hyaline

433. Plantigrad locomotion is found in; **[2007]**
a. Man
b. Dog
c. Horse
d. Dolphin
Answer: man

434. in which of the following disorders the structure and function of normal spinal cord is damaged **[2017]**
a. arthritis
b. sciatica
c. spondylosis
d. disc slip
answer: spondylosis

CHAPTER 17 NERVOUS COORDINATION

435. Human body thermostat is: **[2015]**
A) Medulla

B) Medulla oblongata
C) Body fluid
D) Hypothalamus
Answer: hypothalamus

436. CSF Is found in between: **[2015]**
A) Pia mater and dura mater
B) Pia mater and arachnoid mater
C) Grey mater and pia mater
D) Dura mater and grey mater
Answer: pia matter and archanoid matter

437. Messer's capsules are the receptors for: **[2013]**
(a) Temperature
(b) Pain
(c) Pressure
(d) Touch
Answer: touch

438. The sense of hearing is concerned with: **[2012]**
(a) Cerebrum
(b) Cerebellum
(c) Medulla
(d)Hypothalamus
Answer: cerebrum

439. Rhymicity of respiration is maintained by. **[2010]**
(a) The cardiac center
(b) Ventillation center
(c) Pons
d) Carotid sinus
Answer: pons

440. Hunger centers are located in; **[2010]**
(a) Hypothalamus
(b) Cerebellum
(c) Medulla
(d) Mid brain
Answer: hypothalamus

441. Limbic system in forebrain consists of: **[2010]**
(a) Hypothalamus
(b) Hippocampus
(c) Amygdala
(d) All of the above
Answer: all of the above

442. The individual with hare-lip shows with of the following condition? **[2008]**
(a) Hard Palate
(b) Polydactyl
(c) Cleft-palate
(d) Microcephale
Answer: cleft plate

443. Control centre of speech is; **[2007]**
(a) Medulla oblongata
(b) Diencephalons
(c) Cerebrum
(d) Cerebellum
Answer: cerebrun

444. Goiter is caused by deficiency of: **[2006]**
(a) Sodium in water
(b) Calcium in water
(c) Iodine in water
(d) Sugar in water
Answer: iodine in water

445. A slowly progressive dis ease of the brain that is characterized by the impairment of memory and eventually by disturbance in reasoning, planning, language and perception is one of the following? **[2016]**
(a) Alzheimer's disease
(b) Meningitis
(c) Cerebrovascular accident
(d) Malignant
Answer: alzhimer's disease

446. Which of the following is correct about speed of nerve impulse: **[2016]**
(a) Thicker the nerve fiber-less resistance to flow of current-faster the nerve impulse.
(b) Thicker the nerve fiber-more resistance to flow of current-slower the nerve impulse
(c) Thinner the nerve fiber-less resistance to flow of current-slower the nerve impulse
(d) None of the above
Answer: Thicker the nerve fiber-less resistance to flow of current-faster the nerve impulse.

447. C.S.F" is found in between. **[2016]**
(a) Pia matter and dura mater
(b) Pia mater and arachnoid mater
(c) Pia mater and neural canal
(d) Dura mater and arachnoid mater
Answer: Pia mater and arachnoid mater

448. If medulla oblongata of a person brain is damaged which of the following process will be disturbed? **[2017]**
A) Thinking
B) Sleep
C) Thirst
D) Swallowing
Answer : swallowing

449. In which of the following disorders the structure and function of normal spinal cord is damaged? **[2017]**
A)Arthritis
B)Sciatica
C) Spondylosis
D) Disc slip
Answer: spondylosis

450. 16. Neuron that carries messages from sense organ to the central nervous system is: **[2006]**
(a) Afferent
(b) Efferent
(c) Associative
(d) Interneuron
Answer: afferent

451. **17.** nervous system that prepares itself for flight or fight **[2017**
a. para symphatatic
b. symphatetic
c. somatic
d. peripheral
answer sympatheric

Chapter 18 Chemical Coordination

452. The hormone released by the posterior pitultary. That stimulates the contraction of uterine and mammary gland muscles is called: **[2014]**
A) Prolactin
(b) LH
(c) FSH
(d) Oxytocin
Answer: oxytocin

453. Hypothalamus is a part of: **[2014]**
(a) Diencephalon
(b) Myelencephalon
(c) Metencephalon
(d) Telencephalon
Answer: diencephalon

454. Deficiency of which of the following causes diuresis? **[2014]**
(a) LH
(b) ACTH
(c) FSH
(d) ADH
Answer: ADH

455. Hyper functioning of thyroid gland will cause; **[2005]**
(a) Enlargement of bones
(b) Slow heart rate and nervousness
(c) Loss of body weight
(d) Sexual precocity
Answer: loss of boy weight

456. Speech and language area are located in: **[2012]**
(a) Thalamus
(b) Medulla oblongata
(c) Right cerebral hemisphere
(d) Left cerebral hemisphere
Answer: left cerebral hemisphere

457. Insulin is produced by: **[2012]**
(a) Alpha-cells
(b) Beta-cells
(c) Delta-cells
(b) Gamma-cells
Answer: beta cells

458. Cortisone is an important hormone of; **[2005]**
(a) Adrenal cortex
(b) Adrenal medulla
(c) Cerebral cortex
(d) Cerebral medulla
Answer: adrenal medulla

459. Increased secretion of anti diuretic hormone is due to; **[2005]**
(a) Decreased water supply
(b) Kidney disorder
(c) Homeostatic
(d) Increase water supply
Answer: decreased water supply

460. The target organ for vasopressin is: **[2012]**
(a) Heart
(b) Liver
(c) Stomach
(d) Kidneys
Answer: kidneys

461. Thirst is controlled by: **[2012]**
(a) Pituitary gland
(b) Adrenal gland
(c) Parathyroid
(d) Thyroid
Answer: pitituary gland

462. The rate of metabolism is regulated by: **[2011]**
(a) PTH
(b) Thyroxine
(c) aldosterone
(d) calcitonin
Answer: thyroxine

463. All of the following are growth hormones except: **[2011]**
(a) Phytohormones
(b)Gibberllin
(c) auxins
(d) cytokinins
Answer: phtochromes

464. The hormone that causes seed and bud dormancy in plants is called. **[2010]**
(a) Auxins
(b) Ethylene
(c) Abscisic acid
(d) Gibberellins
Answer: abscisic acid

465. First crystalline hormone is: **[2010]**
(a) Thyroxine
(b) Nor adrenalin

(c) Adrenalin
(d) All of the above

466. Receptors sensitive to smell are: **[2008]**
(a) Mechanical
(b) Chemical
(c) Photo
(d) Physical
Answer: chemical

467. Which hormone prepares the body for situations of stress and emergency? **[2008]**
(a) Adrenaline
(b) Nor adrenaline
(c) thyroxine
(d) insulin
Answer: adrenaline

468. Sense of taste is called: **[2016]**
(a) Gustation
(b) Tactition
(c) Nociception
(d) Olfaction
Answer: gustation

469. Exophthalmia is a classic symptom of: **[2016]**
(a) Hyperthyroidism
(b) Hypocalcemia
(c) Hypochondria
(d) Hyperglycemia
Answer: **Hyperthyroidism**

470. Which of the following is non-steroidal hormone? **[2016]**
(a) Cortisol
(b) Testosterone
(c) Insulin
(d) Aldosterone
Answer: Insulin

18. Release of calcium from bone in to blood is controlled by **[2016]**
(a) Parathormone
(b) Calcitonin
(c) Thyroxine
(d) Both (a) & (b)
Answer: Both (a) & (b)

Chapter 20 Behavior

471. A complex form of learning that requires the manipulation of mental concepts to arrive at adaptive behavior is: **[2014]**
(a) Imprinting
(b) Insight learning
(c) Latent learning
(d) Trial & error learning
Answer: insight earning

472. Which of the following play role in Biorhythm? **[2014]**
(a) MSH
(b) I.H
(c) ADH
(d) Melatonin
Answer: melatonin

473. Corpuscular animals are active during: **[2006]**
(a) Night
(b) Day
(c) Twilight
(d) Spring
(e) **Answer: twilight**

474. Who used puzzle boxes in experiment on animal learning? **[2013]**
(a) Pavlove
(b) E.L. Thorndike
(c) Konrad Lorenz
(d) Kohler
Answer: K.L thromdike

475. The changes in the biochemical composition and physiology occurring at regular intervals in 24 hours is termed as: **[2011]**
(a) gioannual rhythm
(b) lunar rhythm
(c) circadian rhythm
(d) tidal rhythm
Answer: circadian rthym

476. Aestivation is also known as: **[2010]**
(a) Spring sleep
(b) Winter sleep
(c) Autumn sleep
(d) Summer sleep
Answer: summer sleep

CHAPTER-20: REPRODUCTION

477. The enlarged lining epithelium cells connected with groups of developing spermatozoa in testes is: **[2014]**
(a) Somatic cells
b) Sertoll cells
(c) Stem cells
(d) Totipotent cells
Answer: totipotent cells

478. Which one of the following animals is viviparous? **[2013]**
A) Rat
B) Kangaroo
C) Duckbilled platypus
D) Spiny ant eater
Answer: kangroo

479. A single ovum of human being contains: **[2012]**
(a) X — chromosomes
(b)XX — chromosomes
(c) YY— chromosomes
(d)XY — chromosomes

Answer: x-chromosomes

480. The genetic potential for one type of cell from a multi-cellular organism to generate a whole new organism is called:
[2011]
(a) unipotent
(b) multipotent
(c) totipotent
(d) pluripotent
Answer: totipotent

481.

482. Sperms of which animal can remain viable for years within the female genital tract?**[2010],[2009]**
(a) Bat
(b) Whale
(c) Camel
(d) Giraffe
Answer: bat

483. Vitrofertilization takes place in zoo:
[2007]
(a) River
(b) Sea
(c) Land
(d) Laboratory hardware
Answer: laboratory hardware

484. Man reproduction is;
[2007]
(a) Mono estrous
(b) Diestrous
(c) Triestrous
(d) Poly estrous
Answer: poly rstorous

485. Gonorrhea is a sex disease caused by:
[2006]
(a) Bacteria
(b) Virus
(c) Parasite
(d) None of the above
Answer: bacteria

486. 9. The follicle stimulating hormone secreted by the pituitary glands stimulates the growth of; **[2005]**
(a) Uterus
(b) Ovaries
(c) Graffian follicles
(d) Urinarybladder
Answer: graffian follicles

487. 10. World-wide, mortality rate per annum due to AIDS is more than: **[2016]**
(a) One million **(b) Two-million**
(c) Three million (d) five-million
Answer: two million

488. 11. hormone inhibin is produced by **[2016]**
a. hypothalamus
b. pituitary gland
c. prostate
d. sertoli cells

answer:sertoli cells

489. When the sperm count is high, inhibin hormone release increases which: **[2017]**
A) Inhibits anterior pituitary release follicle stimulating g hormone
B) Increase anterior
A) pituitary release of follicle stimulating hormone
B) Inhibitrelease of luteinizing hormone
C) Increaserelease of luteinizing hormoneave

Answer: **Inhibits anterior pituitary release follicle stimulating g hormone**

CHAPTER-21: DEVELOPMENT & AGING

490. .In chick development gives rise to:
[2013]
(a) Ectoderm & Endoderm
(b) Ectoderm & Mesoderm
(c) Mesoderm & Endoderm
(d) Mesoderm only
Answer: ectoderm and mesoderm

491. Muscles develop from:
[2013]
(a) Ectoderm
(b) Mesoderm
(c) Endoderm
(d) all of the above
Answer: mesoderm

492. The organisms developed with two heads and one trunk is called; **[2011]**
(a) Identical twins
(b) Siamese twins
(c) dizygotic twins
(d) fraternal twins
Answer: Siamese twins

493. All of the following are derived from mesoderm except: **[2011]**
(a) Muscles
(b) Liver
(c) Gonads
(d) Blood vessels
Answer:liver

494. During the development of chick peripheral part of the blastoderm lies unsepareted from the yolk and froms: **[2010]**
(a) Area pellucida
(b) Area opaca
(c) Notochord
(d) Primitive streak
Answer: area pellucide

495. Which germinal layer develops in digestive system? **[2010]**
(a) Ectoderm
(b) Mesoderm
(c) Epidermis

(d) Endoderm
Answer: endoderm

496. Cleavage differs from mitosis in that: **[2009]**
(a) It occurs only in zygote
(b) It occurs in all body cells
(c) It results into haploid cells only
(d) It results into identical cells
Answer: it occurs only in zygote

497. The developing embryo is protected against the physical trauma by: **[2008]**
(a) Pericardial fluid
(b) Allontoic fluid
(c) Amniotic fluid
(d) All of the above
Answer: amniotic fluid

498. Two individuals formed when two eggs are fertilized of the same time results in twins that are genetically different are: **[2008]**
(a) Identical twins
(b) Siames twins
(c) Fraternal twins
(d) Double twins
Answer: fraternal twins

499. The mesodermal cell which give rise to urinary system in frog are called; **[2005]**
(a) Pincer cells
(b) Blastomers
(c) Nephrotome
(d) Parietal
Answer: nephrotome

500. The transitory stagein between cleavage and gastrulation is; **[2005]**
(a) Orgenogeneses
(b) Blastula
(c) Gastrula
(d) Development
Answer: blastula

501. Implantation of zygote takes place in the: **[2015-2017]**
A) 2nd week
B) 3rd week
C) 4th week
D) 5th week
Answer: 4th weak

502. Mature ovum in human beings is surrounded by: **[2015]**
A) Plasma membrane
B) Vitelline membrane
C) Corona radiate
D) All of the above
Answer: all of the above

503. acetabularia meditteranea is **[2017]**
A) fungus
B) an algae
C) c. a protozoa
D) a prokaryotic
answer: an algae

504. the common name of rubella is **[2018]**
a. whooping cough
b. german measles
c. African seeping disease
d. Tay sach's disease
Answer: german measles

505. The organism developed with two heads and one truck is called **[2018]**
a. Identical twins
b. Dizyomatic twins
c. Fraternal twins
d. Siamiese twins
Answer: Siamese twins

CHAPTER-22: INHERITANCE

506. The cross between two dissimillar individuals is called: **[2014]**
(a) Test cross
(b) Interbreeding
(c) Epistasis
(d) Hybridization
Answer: hybridization

507. In which of the following the phenotypic and genotypic ratio is the same? **[2013]**
(a) Co-dominance
(b) Over dominance
(c) Epitasis
(d) Incomplete dominanc
Answer: incomplete dominance

508. In a dihybrid cross, how many homozygous offsprings can be produced? **[2012]**
(a) 4
(b) 3
(c) 2
(d) 9
Answer: 2

509. How many genotype will be produced by crossing of two alleles "A" and "a"? **[2012]**
(a) One
(b) Two
(c) Three
(d) Four
Answer: one

510. In human being, the carrier of colour blind is: **[2012]**
(a) Male
(b) Female
(c) Both male and female
(d) None of them
Answer: female

511. Haemophilia affects males more than females because of: **[2012]**

(a) Dominant autosomes
(b) Dominant X- linked
(c) Recessive X- linked
(d) y- chromosome linked
Answer: recessive X linked

512. Which blood group transfusion can be made without risk? **[2012]**
(a) Group A to group B
(b) Group AB to group O
(c) Group A to group O
(d) Group B to group AB
Answer: group B to group AB

513. A Test cross is: **[2012]**
(a) Tt × Tt
(b) Tt × tt
(c) TT × Tt
(d) TT × TT
Answer: Tt x tt

514. Organisms phenotypically similar but genotypically different are said to be: **[2012]**
(a) Monozygous
(b) Homozygous
(c) Heterozygous
(d) Multizygous
Answer: Heterozygous

515. Changes in gene frequencies in small population by chance is called: **[2013],[2009]**
(a) Gene pool
(b) Genetic drift
(c) Gene mutation
(d) Gene flow
Answer: genetic drift

516. Which one of the following is a sex-linked inheritance? **[2013]**
(a) Baldness
(b) Albinism
(c) Eye colour
(d) Myopia
Answer: eye colouor

517. An individual with contrasting alleles is called: **[2012]**
(a) Homozygous
(b) Monoecious
(c) Heterozygous
(d) Dioecious
Answer: hetrozygous

518. A Punnet square is used to determine the: **[2011]**
(a) result of mitosis
(b) result of meiosis
(c) actual outcome of a cross
(d) probable outcome of cross
a. **Answer: probabla out come of cross**

519. A woman is homozygous for A– negative blood type. A man has AB– negative blood type. What is the probability that the couple's child will be type B – negative? **[2011]**
(a) 0 %
(b) 25 %
(c) 50 %
(d) 75 %
Answer: %

520. If two interozygous tall plants are crossed together the proportion of Phenolypically tall plants will be: **[2014]**
(a) 50%
(b) 25%
(c) 75%
(d) 100%
Answer: 75%

521. If father of a baby is hemophilic and mother is a carrier then chances of the baby in inheriting the disease will be: **[2010]**
(a) 0%
(b) 50%
(c) 75%
(d) 100%
Answer: 50%

522. If red and white colour flowers in mirabulus jalapa are crossed, the F_1 generation will show: **[2008]**
(a) All red
(b) all white
(c) all pink
(d) 1. Red, 2, pink & 1 white ration
Answer: 1. Red, 2, pink & 1 white ration

523. Which one of the following characteristics in man is controlled by a recessive gene? **[2008]**
(a) tongue rolling
(b) Diabetes
(c) Skin colour
(d) Eye colour
Answer: diabetes

524. In which case the genotypic and phenolypic ratio will be 1:2:1? **[2008]**
(a) Complete dominance
(b) incomplete dominance
(c) Co-dominance
(d) None
Answer: incomplete dominance

525. A cross between F1 hybrid with either of parents is called; **[2007]**
(a) Back cross
(b) Test cross
(c) Reverse cross
(d) None of the above
Answer: back cross

526. Who is considerd to be the father of genetics? **[2007]**

(a) Weisman
(b) Bateson
(c) Mendel
(d) Morgan
Answer: mendel

527. In geneaction the gene that mark the expression of another gene is formed as: **[2006]**
(a) Hypostatic
(b) Epistatic
(c) Hemistatic
(d) Neostatic
Answer: epistatic

528. The total of all the allele in a population is called: **[2006]**
(a) genetic drift
(b) genotype
(c) gene pool
(d) gene mutation
Answer: gene pool

529. The allele that exist in more than two different forms are called ; **[2005]**
(a) Polygenic alleles
(b) Multigenic alleles
(c) Multiple alleles
(d) Hetrogenic alleles
Answer: multiple allele

530. Law of independent assortment cannot be applied on; **[2005]**
(a) Dominant genes
(b) Recessive genes
(c) Linked genes
(d) Autosomalgenes
Answer: linked genes

531. The florescent pigments in the eyes of fruit fly is an example of: **[2016]**
(a) Over dominance
(b) Complete dominance
(c) Incompliete
(d) Co-dominance
Answer: Over dominance

CHAPTER-23: CHROMOSOME & DNA

532. In Eukaryotes, DNA replication proceeds at the rate of: **[2014]**
(a) 50 base pairs per seconds
(b) 40 base pairs per seconds
(c) 20 base pairs per seconds
(d) 30 base pairs per seconds
Answer: 50 base pairs per seconds

533. The particular array of chromosomes that an individual possessed is called its: **[2014]**
(a) Genotype
(b) Phenotype
(c) Karyotype
(d) Genome
Answer: karyotype

534. If the coding sequence on the DNA is AATIGCT, the sequence in the mRNA will be: **[2014]**
(a) AAUOCGT
(b) UUAACGA
(c) TTAACGA
(d) UUTTCGT
Answer: TTAACGA

535. Gene and chromosomes show parallel behavior except: **[2014]**
(a) Number
(b) Inheritance
(c) Heredity
(d) Composition
Answer: number

536. Replication progresses at a rate of about 50 base pairs per second in: **[2013]**
(a) Bacteria
(b) Virus
(c) Eukaryote
(d) All of the above
Answer: eukaryote

537. Avery, Macleod and McCarty repeated the Griffith experiment in the year: **[2013]**
(a) 1869
(b) 1928
(c) 1944
(d) 1952
Answer: promoter

538. The two chains of DNA occur side by side in a: **[2013]**
(a) Straight direction
(b) Parallel but straight
(c) Parallel but opposite
(d) Parallel, opposite and folded spirally
Answer: parallel, opposite and folded spirally

539. What will be the anti-coden of AUG? **[2013],[2008]**
(a) TAC
(b) ATC
(c) UAC
(d) UTC
Answer: UAC

540. A specific nudeotide sequence on DNA molecule to which RNA polymerase attaches to initiate transcription of mRNA from a gene is called: **[2014]**
(a) Poly genes
(b) Genome
(c) Promoter
(d) Pletoropy
Answer: paromoter

541. How many atoms of oxygen in R.N.A are greater than D.N.A? **[2012]**
(a) One
(b) Two
(c) Three
(d) Four
Answer: one

542. During replication which sequence of nucleiotides would bond with the DNA sequence TATGA? **[2011]**
(a) AUAGA
(b) ATACA
(c) UAUGA
(d) ATACT
Answer: ATACT

543. Diameter of histone is:
[2011]
(a) 1 nm
(b) 2 nm
(c) 3 nm
(d) 4 nm
Answer: 2nm

544. The number of nitrogenous base common in both D.N.A and R.N.A are; **[2011]**
(a) Two
(b) three
(c) five
(d) four
Answer: three

545. Which one of the following diseases is due to point mutation? **[2010]**
(a) Down syndrome
(b) Klinefelter syndrome
(c) Phenylketonuria
d) Turner syndrome
Answer: phenylketonuria

546. The term Gene was coined by:
[2010]
(a) Johnson
(b) Corren
(c) Tschmarch
(d) Purkinje
Answer: johanson

547. Two parents strands of DNA molecules are: **[2009]**
(a) Parallel
(b) Antiparallel
(c) both
(d) None
Answer: antiparallel

548. In chromosome, the material controlling heredity is: **[2009]**
(a) Histone
(b) RNA
(c) DNA
(d) All of above
Answer: DNA

549. The term BIVALENT means:
[2008]
(a) Two chromatics
(b) Two chromosomes
(c) Four chromatids
(d) Four chromosomes
Answer: two chromosomes

550. If the sequence of the one strand of DNA is ATGCTC, the sequence of the other strand would be: **[2008]**
(a) CACGTC
(b) TAGCATG
(c) TACGAG
(d) GACGTG
Answer: TACGAG

551. Which of these are carries of genetic information? **[2006]**
(a) rRNA
(b) mRNA
(c) DNA
(d) Nucleotides
Answer: DNA

552. Which one of the following is the additional function of the embryonic membranes? **[2005]**
(a) Respiration and reproduction
(b) Reproduction and nourishment
(c) Storage of waste products
(d) Respiration and storage of waste products
Answer: respiration and storage of waste products

553. DNA and histones together form a bead like structure called; **[2005]**
(a) Mesosome
(b) Polysome
c) Nucleosome
(d) Centrosome
Answer: nucleosome

554. In sickle cell haemoglobin only one glumalic acid of normal haemoglobin is replaced by; **[2005]**
(a) Valine acid
(b) Alanine acid
(c) Arginine acid
(d) Methionine acid
Answer: valine acid

555. The process of cell division result in: **[2011]**
(a) two daughter cells
(b) sister chromatids
(c) mitosis
(d) unregulated growth
Answer: two daughter cells

556. Replication of DNA occurs during:
[2014], **[2012]**

(a) Interphase
(b) Prophase
(c) Metaphase
(d) Anaphase
Answer: interphase

557. Cell death due to tissue damage is called: **[2013]**
(a) Cancer
(b) Apoptosis
(c) Necrosis
(d) Metastasis
Answer: necrosis

558. Condensation of chromosomes reaches to its peak during early; **[2010]**, **[2009]**
(a) Prophase
(b) Metaphase
(c) Anaphase
(d) Telophase
Answer: metaphase

559. In which of the following organs of man does meiosis occur; **[2005]**
(a) Liver
(b) Kidney
(c) Ovaries
(d) Heart
Answer: ovares

560. In mitochondria UGA Codon act to specify; **[2015]**
A) Arginine
B) Glutamic acid
C) Tryptophan
D) Valine
Answer: tryphtophan

561. Both DNA and RNA are synthesize by the process of: **[2014]**
(a) Transcription
(b) Replication
(c) Polymerization
(d) PCR
Answer: polymerization

562. The florescent pigments in the eyes of fruit fly is an example of: **[2016]**
(a) Over dominance
(b) Complete dominance
(c) Incompliete
(d) Co-dominance
Answer: Over dominance

563. Stop codons are: **[2016]**
(a) UAA,UAG,UGA
(b) UGC,UCG,AAA
(c) UUG,UCG,UCA
(d) UAA,UGC,UCA
Answer: (a) UAA,UAG,UGA

564. **33** DNA polymerase adds nucleotides to the 3' end of the primer so the direction of replicationwill be? **[2017]**
A) 5' to 3'
B) 3' to 5'
C) 3' end of the primer to 3' end of template strand
D) 3' end of the template strand to the 3' end of the primer
answer:5' to 3'

565. XX-XY type of sex determination pattern is present in which of the following organisms? **[2017]**
A) Humans
B) Butterflies
C) Grasshopper
D) Drosophila
Answer: butter flies

566. how many nucleotides are there in 12 mRNA codons **[2017]**
a. 12
b. 24
c. 36
d. 48
answer: 36

567. 36. which one of the following is non sence codons **[2017]**
a. UGA
b. UAU
c. CAU
d. GAU
answer: UGA

568. . if a disorder is not present in a child family but the fetus itself is infected before birth,it is known as **[2017]**
a. somatic mutation
b. heredity mutation
c. germ line mutation
d. de novo mutation
answer: deovo mutation

569. what will happen when nucleotide is deleted from a gene having 9 nucleotides in its transcriptional units **[2017]**
a. change in phenotype
b. no change in phenotype
c. syntheises of three amino acids
d. syntheises of four amino acids
answer: change in phenotype

570. 39. male having Down syndrome have sex chromosomes **[2018]**
a. XXY
b. XY
c. XYY
d. XYYY
Answer XY

571. in protein synthesis the initior tRNA carrying amino acid methionine land on which site of ribosome **[2018]**
a. E site
b. P site

c. A site
d. C site
Answer;: P site

572. polyploidy is more common in [2018]
a. plants
b. animals
c. bacteria
d. Virus
answer: plants

573. amino acid leucine is coded by how many codons [2018]
a. 1
b. 2
a. 4
b. 6
Answer: 6

CHAPTER-24: EVOLUTION

574. Human arm is homologous with: [2014]
(a) Sea flipper
(b) Octopus Tntade
(c) Bird wing
(d) Both A and C
Answer:both a and c

575. A bird's wings are homologous to: [2011]
(a) fishes tail fin
(b) dog's front legs
(c) mosquito's wings
(d) alligator's claws
Answer: dogs front legs

576. An inherited characteristic that increases an organism ability to survive and reproduce in its specific environmental is called: [2011]
(a) radiation
(b) adaptation
(c) vestigial organ
(d) speciation
Answer: adaptation

577. Appendix is vestigial in man but may play role in: [2013],[2009]
(a) Digestion
(b) Excretion
(c) Movement
(d) Immunity
Answer: immunity

578. The modern horse is called: [2008]
(a) equas
(b) Eohippus
(c) Mesohippus
(d) Mercyhippus
Answer: equas

579. Crop rotation leads to: [2008]
(a) Increase in the soil nutrient
(b) more aeration of soil
(c) Soil fertility
(d) All
Answer: all

580. Wings of abird and fore limbs of man are: [2008]
(a) Homologous
(b) Analogous
(c) Acquired
(d) Vestigial
Answer: homologous

581. In the human body all the given organs are vestigial except; [2005]
(a) Appendix
(b) Leg muscles
(c) Coccyx
(d) Nictitating membrane
Answer: leg muscles

582. The theory of uniformitarianism was proposed by: [2014]
(a) Hutton and Lyell
(b) Lamarck
(c) George Cuvier
(d) Darwin
Answer: hutton and lyell

583. The theory of new creation was composed by: [2014]
(a) George Cuvier
(b) James Hutton
(c) Louis Agassiz
(d) Wallace
Answer: Louis Agassiz

CHAPTER-25: MAN AND HIS ENVIRONMENT

584. Ozone layer is present in the: [2011]
(a) Troposphere
(b) stratosphere
(c) Mesosphere
(d) atmosphere
Answer: (b) stratosphere

585. All of the following are non renewable resources of energy EXCEPT. [2010]
(a) Forests
(b) Iron
(c) Petroleum
(d) Natural gas
Answer: (a) Forests

586. Chlorofluorocarbons are mainly responsible for: [2010]
(a) Air pollution

(b) Water pollution
(c) Acid rain
(d) Ozone layer depletion
Answer: (d) Ozone layer depletion

587. Food is renewable resource due to: **[2008]**
(a) Mechanical forming
(b) Improved crop varieties
(c) Continuous photosynthesis
(d) pest control
Answer: (c) Continuous photosynthesis

588. Green house effect is NOT produced by the abundance of the gas called; **[2006]**
(a) Methane
(b) CO_2
(c) Nitrous oxide
(d) Sulphur dioxide
Answer: (d) Sulphur dioxide

589. A study of communities in relation to environment is called: **[2014]**
(a) Social ecology
(b) Synecology
(c) Autoecology
(d) Heteroecology
Answer: (b) Synecology

590. Abacterium that converts NO_2 to NO_3 is: **[2012]**
(a) Rhizobium
(b) Bacillus
(c) Nitrosomanas
(d) Nitrobecter
Answer: (d) Nitrobecter

591. The association in which an organism gets advantage and the other suffers is called: **[2008]**
(a) symbiosis
(b) parasitism
(c) predation
(d) mutualism
Answer: (b) parasitism

592. Each organism has a definite funchtional position different from either organism s of the locally is called: **[2008]**
(a) Community
(b) Niche
(c) Habitat
(d) specious
Answer: (b) Niche

593. The ecological factor which does NOT change from place to place is: **[2006]**
(a) Precipitation
(b) Temperature
(c) Gravity
(d) Light
Answer: (c) Gravity

594. In an ecosystem having four tropic levels. The amount of energy fixed at producers level is 23197 kcal. About how much energy will be fixed by the primary carnivores? **[2006]**
(a) 2317 Kcal
(b) 232 kcal
(c) 1564 kcal
(d) None of the above
Answer: (a) 2317 Kcal

595. Rabbits, pabulus, rats grasshoppers and grasses constitute a: **[2006]**
(a) Habitat
(b) Biome
(c) Community
(d) Population
Answer: (c) Community

596. Which one of the following is a marine alga; **[2005]**
(a) Nostoc
(b) Volvox
(c) Spirogyra
(d) Ulva
Answer: (b) Volvox

597. Ozone gas is: **[2013]**
(a) Greenish, tasteless and light
(b) Greenish blue, bitter in taste
(c) Blue. Poisonous and explosive
(d) Purple yellow, non poisonous, non explosive
Answer: (c) Blue. Poisonous and explosive

598. C.F.C gases are produced from: **[2011]**
(a) Burning of coal
(b) burning of charcoal
(c) Automobiles engines
(d) Refrigeration and air conditions
Answer: (d) Refrigeration and air conditions

599. bacterium that converts NO_2 to NO_3 is **[2018]**
a) Rhizobium
b) Bacillus
c) Nitrosomonas
d) Nitrobactor
Answer: nitrobactor

600. rabbits, pabulus, rats grasshopper constitue a **[2018]**
a) Habitat
b) Biome
c) Community
d) Population
Answer: community

601. The first stage in development of xerose is appearance of **[2018]**
A) Foliose lichen
B) Crustose lichen
C) Fructcose lichen
D) Climax stage
Answer:

19.Which one of the following is a shrub **[2018]**

a. Parmelia
b. Aster
c. Rhus
d. Banana

Answer: rhus

Chapter-26: Biotechnology

602. Any DNA molecule having foreign DNA is called: **[2014]**
(a) Mutant
(b) Recombinant
(c) Crossing over
(d) All of the above
Answer: (b) Recombinant

603. A plant or animal modified by genetic engineering is called: **[2013]**
(a) Transgenic
(b) Probe
(c) Recombinant
(d) Plasmid
Answer: (a) Transgenic

604. The primers used in polymerase chain reaction has a sequence of bases: **[2013],[2009]**
(a) 8
(b) 12
(c) 16
(d) 20
Answer: (d) 20

605. Restriction enzymes are of great use in genetic engineering because: **[2012]**
(a) They cut DNA at a specific base level
(b) They cut D.N.A at several specific levels
(c) They help in binding the pieces of D.N.A
(d) They are nuclease
Answer: (a) They cut DNA at a specific base level

606. A cross between dissimilar individuals to bring together their best characteristics is called: **[2011]**
(a) Genetic Engineering
(b) Hybridization
(c) Interbreeding
(d) Sequencing
Answer: (b) Hybridization

607. Organism that contain genes from other organisms are called: **[2011]**
(a) Mutagenic
(b) Transgenic
(c) Clones
(d) Sequencing
Answer: (b) Transgenic

608. Tissue plasminogen activator (TPA) is used for: **[2010]**
(a) Treating anemia
(b) Bonemarrow transplant
(c) Dissolving blood clot
(d) Treatment of cancer
Answer: (c) Dissolving blood clot

609. Which one of the following comes into existence when bacterial plasmid naturally modified to produce it? **[2016]**
(a) pBR 322
(b) Npq 303
(c) oSR 210
(d) kMG 319
Answer : pBR322

610. That 1st field trial of genetically engineered plants occurred in France and USA in: **[2016]**
(a) 1980
(b) 1982
(c) 1984
(d) 1986
Answer: 1986

611. Individuality of every persons is maintained by nucleotide genome sequence difference of:
a. **1%**
b. 2%
c. 3%
d. 5%
Answer: 1%

612. which one of the following is suitable vector to be incorporated with the large external DNA fragment **[2017]**
a) Small size vector
b) Large size vector
c) Large size vector with no origin of replication
d) Small size of vector with no origin of replication
Answer: small size vector

613. if one of the following component is missing , bacteria cannot increase the number of its plasmid copies **[2017]**
a) Antibiotic resistance genes
b) Origin of replication
c) Cloning site
d) Ligase enzyme
Answer origin or replication

614. what will happen if a vector (plasmid) is cut with a different restriction enzyme which cuts the external DNA to be incorporated in the vector **[2018]**
a) Ligation
b) No ligation
c) Tight ligation
d) Cloning
Answer: ligation

615. all of the following acts as cloning vectors except **[2018]**
a. BAC
b. YAC
c. Cosmids
d. EcoRI
Answer EcoRI

CHAPTER-27: BIOLOGY AND HUMAN WELFARE

616. Live attenuated vaccines are used to treat all of the following diseases except: **[2012],[2010]**
(a) Typhoid and plague
(b)Polio and measles
(c) Cholera and rabies
(d)Mumps and influenza
Answer: (c) **Cholera and rabies**

617. A cloned baby sheep "Dolly" was attributed to: **[2011]**
(a) Four Parents
(b) Three Parents
(c) Two parents
(d) One Parent only
Answer: (d) One Parent only

618. A cloned baby sheep Dolly was identical to the parent that: **[2010],[2009]**
(a) Gave birth to the dolly
(b) Donated reproductive cells
(c) Donated somatic cell
(d) Both A and B
Answer: (c) Donated somatic cell

619. Live attenuated vacclines are used to treat all of the following diseases EXCEPT? **[2010]**
(a) Cholera and rabies
(b) Typhoid and plague
(c) Mumps and measles
(d) Yellow fever and rubella
Answer: (a) Cholera and rabies

620. Cloned dolly was identical to the: **[2009]**
(a) Parents, who gusted and gave birth to dolly
(b) Parent, who donated egg-cell
(c.) Parent, who donated somatic-cell
(d) Bothe (b) and (c)
Answer: (c.) Parent, who donated somatic-cell

621. Qunine, an a drug very effective against malaria, is derived from the bark of; **[2005]**
(a) Quina quina
(b) Lathyrus plant
(c) Calotropis plant
(d) Cinchona plant
Answer: (d) Cinchona plant.

622. which of the following vaccine has least side effect **[2017]**
a) Attended vaccine
b) Killed vaccine
c) Subunit vaccine
d) Toxoid vaccine

623. which of the following is not daughter cell **[2018]**
a) Buffalo
b) Mule
c) Elephant
d) Yak
Answer: buffalo

624. which of the following is summer variety **[2018]**
a) Figs
b) Cabbages
c) Oranges
d) Pears
Answer;figs

625. the amount of methane in biogas is approximately **[2018]**
A) 10-30%
B) 50-90%
C) 50-75%
D) 60-75%
Answer: 50-75%

MATHS

ETEA Engineering 2019

1. $\int_1^2 (\sqrt{x} + \frac{1}{\sqrt{x}}) \sqrt{x}\, dx$:
   a) 5/2 b) $2^{3/2}$ -1
   c) ½ d) 2

2. The maclaurin's expansion of coshx is:

3. If f(x) = $16\sqrt{x}$ than f " (4) =
   a) 1/4 b) -1/4
   c) 1/16 d) -½

4. Maths

5. Maths

6. $\int \frac{1}{cos^2 2x}\, dx =$
   a) ½ cps 2x + c
   b) ½ln[sec2x + tan 2x] + c
   c) ½ tan 2x + c
   d) ½ ln[cos (2x) - cot (2x)] + c

7. Limit

8. For a function f(x) = x^2 -5x +2. Newton's-Raphson method fails for
   a) x_0 = 2/5 b) x_0 = -5/2
   c) x_0 = 5/2 d) x_0 =-2/5

9. $\frac{d}{dx} x^a = ?$
   a) ax^{a-1} b) 0
   c) $x^a \log_x a$ d) x^a

10. $\frac{d}{dx}(\frac{1}{x}) =$
    a) x^2 b) $-x^2$
    c) $\frac{1}{x^2}$ d) $-\frac{1}{x^2}$

11. The sign of the tangent to the curve y= x^3+5 at the point (1,2) is:
    a) 6 b) 2
    c) 5 d)3

12. Maths

13. A homogenous equation of degree two has parallel lines only, when :

14. The order of equation (2x-y+3)dx (y-2x-2)dy=0
    a)0 b)1
    c)2 d)3

15. Which one of the following function are homogenous?
    a) x siny + y sin x
    b) $xe^{y/x} + ye^{x/y}$
    c) $x^2 - x^2$ y
    d) arc sin xy

16. Find f_0 of f(x,y) = $\sin^{-1}$ xy is
    a)$\frac{x}{\sqrt{1-x^2y^2}}$ b)$\frac{x}{\sqrt{1-x-y^3}}$
    c)$\frac{-y}{\sqrt{1-x^2y^2}}$ d)$\frac{-y}{1-x^2y^2}$

17. For non linear function f(x) = 0, Newton-Naphson method is
    a) b) c) d)

18. The accuracy of the approximation can be improved when approximating strip has:
    a)parabolic arc
    b) squares
    c) tripozoids
    d)rectangles

19. A vector can be multiplied by a number, the number may be D
    a) Dimensionless
    b) dimension scalar
    c) negative
    d) all a, b and c are correct

20. Equations having a common solution are called.
    a) Linear equations
    b) homogeneous equations
    c) simultaneous equations
    d) none of the above

21. Transpose of a rectangular matrix is a:
    a) rectangular matric
    b) diagnol matrix
    c) square matrix
    d)scalar matrix

22. When a selection of objects is made without paying regard to order of selection, it is called the:
    a) permutation b)combination
    c) series d) sequence

23. Two factorization of x^2 + x is;
    a) (z+$\sqrt{6}$)(x-$\sqrt{6}$)
    b)$(z+6)^2$
    c) (z+$\sqrt{6t}$)(x+$\sqrt{6t}$)
    d)(z+$\sqrt{6t}$)(x-$\sqrt{6t}$)

24. if slope of a line is 2 then slope of the line perpendicular to this line is equal to
    a) -2 b)-½
    c) 2 d) 0

25. A line x=
    B touch a circle
    $x^2 + y^2$ -6x -4y – 12 =0 at:
    a) (2,8) b)(8,-2)
    c) (8,2) d)(-2,8)

26. The line y= mx + c intersects the circle $x^2 + y^2 = a^2$ at the mast of ____ points
    a)1 b)2
    c)3 d)4

27. The equation $(x+4)^2 + (y-1)^2$ = b represents a circle with radius
    a)$\sqrt{6}$ b)6
    c)0 d)1

28. A line y=-x-c, will touch a parabola $x^2 - \beta y$ only when
a)½ b)-2
c)2 d)-½

29. The focus of the parabola y^2 = -B (x-3) is ?
a)(0,1) b)(1,0)
c)(0,1) d)(1,1)

30. A differential equation is considered to be ordinary if it has;
a)more dependent variable
b) more than one dependent variable
c)one independent variable
d) nore than one independent variable

31. The differential equation $2\frac{dy}{dx} + x^2y = x+2$
a)linear
b) non linear
c)linear with fixed points
d) undeterminable to be linear or non linear

32. The dimensions of angular momentum are C
a) MLT^2 b) ML^2T^{-2}
c) ML^2T^{-1} d) $ML^3 T^{-1}$

33. Which one of the following statements is incorrect for vectors? C
a) $|\overrightarrow{AB}| = |\overrightarrow{BA}|$ b) $|\overrightarrow{AB}| = |\overrightarrow{AB}|$
c) $\overrightarrow{AB} = \overrightarrow{-AB}$ d)) $\overrightarrow{AB}$ $north =$ $\overrightarrow{AB}$ south

34. The reciprocal of the number 'ί' is
a)1 b)-1
c) ί d)- ί

35. $a^2 + b^2$ = _______
a) (a+b)(a-b) b)(a + ίb)(a- ίb)
c) (a+b)(a-ίb) d)(a+ b^2)(a-b)

36. If A is a symmetric matrix, then A^t is
a)A b)IAI
c)0 d)Diagnol matrix

37. If A is a matrix of order mxn and B is matrix of order n x p then order of BA is:
a)p x m b)p x n
c)n x p d) m x p

38. The scalar triple product of i-j,j-k and k-I is?
a) 1 b)0
c) -1 d)3

39. For three vectors a,b,c, d(b+c) = b (d+c), then ?
a)a (b+c) = 0 b) c(a+b) = 0
c)b(a+c)=0 d) c(a+b) = 0

40. For non-collinear vector **A** and **B**, the correct result is
a)p**A** + q**B** = 0, p≠0, q≠0
b) p**A** + q**B** = 0, p=0, q=0
c) p**A** + q**B** ≠ 0, p=0, q=0
d) p**A** + q**B** ≠ 0, p≠0, q≠0

41. Arthmetic mean between 2 +$\sqrt{2}$ and 2 - $\sqrt{2}$ is:
a) 2 b)$\sqrt{2}$
c)0 d) 4

42. A function whose domain is the set of natural numbers is called
a) identity function
b) series
c) sequence
d) onto function

43. If sum of five arthmetic mean b/w a and b is 50, then their arithmetic mean is;
a) 25 b)50
c)10 d)20

44. $\frac{cosxsecx}{\cos x}$ = _______
a) tan x b)
c) d)

45. $\frac{cos\theta - \tan\theta}{sin\theta\ sin\theta}$ = _____
a)-tan $(\frac{\theta-\varphi}{2})$ b) tan $(\theta - \varphi)$
c) tan $(\frac{\theta-\varphi}{2})$ d)- tan $(\theta - \varphi)$

46. The expression tan (3θ) = _____?
a) $\frac{1 \tan\theta - tan^3\theta}{1 - tan^3\theta}$
b) $\frac{3 \tan\theta - tan^3\theta}{1 + 3\ tan^3\theta}$
c) $\frac{3 \tan\theta - tan^3\theta}{1 - 3tan^3\theta}$
d) $\frac{1 \tan\theta + tan^3\theta}{1 - 3tan^3\theta}$

47. Law of cosine states that :
a) $a^2 = b^2 + c^2 - 2bc \cos\gamma$
b) $b^2 = a^2 + c^2 + 2bc \cos\beta$
c) $c^2 = a^2 + b^2 - 2bc \cos\gamma$
d) $a^2 = b^2 + c^2 - 2bc \cos\alpha$

48. Numerical integration for single function is also called
a) area b) volume
c) numerical quadrature d)both A and C

49. Domain of sec[x] is ;
a) [-1,1]
b)R
c) R → [x]x = (2n+1)π/2, neZ
d) R → [x]x = nn, niZ

50. Principle value of $\cos^{-3}$[cos(5)]?
a)5 b)π-5
c)5-π d) 2π-5

51. The relation sec [arc tanx] = ?
a)$\sqrt{x^2-1}$ b)$\frac{1}{\sqrt{1+x^2}}$
c) $\sqrt{x^2+1}$ d)$\frac{1}{\sqrt{1-x^2}}$

52. $\int x^2\, dx$ = C
a) x^2 +c b)π^2+c

c) $\frac{x^{x+3}}{x+3} + c$ d) $\pi x^{x-1} + c$

53. The n^{th} term of arithmetic geometric mean is
a) $[a+(n-1d)]r^n$ b) $[a+(n-1d)]r^{n-1}$
c) $[a+(n-1d)]r$ d) $[a+ nd)]r^{n-1}$

54. ${}^5C_2 + {}^5C_3 =$
a) ${}^5C_3$ b) ${}^4C_1$
c) ${}^5C_2$ d) ${}^4C_1$

55. For independent events A and B , P(A ∩ B) = ?
a)P(A),P (B/A) b)P(A) U P(B)
c)P(A),P(B) d)P(A) ∩ P(B)

56. For a random experiment, all possible outcome are
a) numerical space b)sample space
c) event space d) both b and c

57. If x is so small that square and higher powers can be neglected then $(1+3x)^{-2}$ =
a)1+9x b)1-9x
c) 1+6x d) 1-6x

58. The last term of the expansion are $(3x+3y)^{-2}$ is
a) $7y^7$ b) $3^7 y^7$
c) $21y^7$ d) y^7

59. Which one of the following equations is not a function of y with respect to x/
a) 2x+3y = 6
b) $x^2 - y = 6x-5$
c) $x^2 + y^2 = 16$
d) $y = 4x^3 - 5x^3 + 3x - 7$

60. The inverse function for the following functions $f(x) = \frac{x}{x+1}$ is:
a) $\int^{-1}(x) = \frac{x}{x+1}$ b) $\int^{-3}(x) =$ xy+x
c) $\int^{-3}(x) =$-x-1 d) $\int^{-1}(x) = -\frac{x}{x+1}$

61. Ther e may be _____ feasible solution of the feasible region.
a)infinite b)limited
c) finitne d)defined

62. In linear programing, objective function and objective constants are
a)solvedb)linear
c)quadric d)adjecent

CHAP NO 1 COMPLEX NUMBERS

I) The multiplicative identity in the set of complex of number is ; 2018

a) (0,0) b) (0,1)

c)(,10) d) (1,)

ans: C

II) For a non zero complex number number z, which of the following is true for ''1/z'' **2018**

a)$\frac{z-}{|z|^2}$ b)$\frac{z}{|z|^2}$

c)$\frac{1-}{|z|^2}$ d)$\frac{1}{|z|^2}$

ans: a

III) Which option is true for imaginary part of $(x-iy)^{-1}$: 2018

a)$\frac{-y}{x^2+y^2}$ b)$\frac{y}{x^2+y^2}$

c)$\frac{iy}{x^2+y^2}$ d)$\frac{-y}{x^2+y^2}i$

ans: b

IV) One factor of polynomial $p(z) = z^3 + 5z^2 + 19z-25$; 2018

a)z+1 b)z-1

c)z+I d)z-i

ans: b

V) |Z| = |-Z| for a complex number Z, if only and if ot holds that: 2017

i)Z=-Z ii)$Z=\vec{Z}$ iii) $Z = -\vec{Z}$

a) only i holds b) i and ii both holds

c) i,ii and iii holds d)either i and ii holds

ans: c

VI) If $x+iy = (5-3i)^3$, then x ______ 2017

a)(10,198) b)(10,-198)

c)(-10,+198) d)(-10,-198)

ans: d

VII) Complexes exists in various coordination numbers, choose the coordination number which is less common

a)2 b)4

c)55 d)6

ans: c

VIII)Let (fog)(x)= $\sqrt{x^2-1}$ -1 = and g(x) =x^2+1, then f(4) = ____ 2017

a)1 b)-1

c)2 d-2

ans: a

1) $(5-4i)^{-1}$ can be written in the form of $x+iy$ as: **2010-79 Eng**

(a) $\frac{5}{41}-\frac{4}{41}i$ **(b)** $\mathbf{\frac{5}{41}+\frac{4}{41}i}$ (c) $\frac{5}{9}+\frac{4}{9}i$ (d) $\frac{5}{9}-\frac{4}{9}i$

Hint: Since $(a+ib)^{-1}=\frac{a}{a^2+b^2}+i\frac{-b}{a^2+b^2} \Rightarrow (5-4i)^{-1}=(5+(-4)i)^{-1}=\frac{5}{5^2+(-4)^2}+i\frac{-(-4)}{5^2+(-4)^2}=\frac{5}{41}+i\frac{4}{41}$

---

2) Which of the following is not the binary operation in ℕ
2010-86 Eng

(a) + **(b)** − (c) × (d) None

Hint: As difference of two natural numbers is not always a natural number, e.g; $1-2=-1\notin ℕ$, so subtraction $(-)$ is not a binary operation in ℕ

---

3) Let $G=\{1,-1,\ i,-i\}$, then $(G,\times)$ is ……. **2010-117 Eng**

(a) Group (b) Not a group **(c) A belian group** (d) None of the above

Hint:

4) From the adjacent table, it is clear that;
(i) G is closed w r t $\times$ (ii)$\times$ is associative and commutative in G,
(iii) The identity element 1 and inverses of each element exist in G, so $(G, \times)$ is an abelian group.

$\times$	1	-1	i	$-i$
1	1	-1	i	$-i$
-1	-1	1	$-i$	i
i	i	$-i$	-1	1
$-i$	$-i$	i	1	-1

5) Product of the roots of the equation $ax^2 + bx + c = 0$, where a, b, c $\in$ and $a \neq 0$, is .... **2010-164 Eng**

(a) $\frac{c}{a}$ (b) $-\frac{c}{a}$ (c) Undefined (d) 0

Hints: Products of the roots $= \frac{\text{Constant term}}{\text{Coefficient of } x^2} = \frac{c}{a}$

6) Modulus of $a + bi$ is: **2011-1 Eng**

(a) $a^2 + b^2$ **(b) $\sqrt{a^2 + b^2}$** (c) $\sqrt{a^2 - b^2}$ (d) $a - bi$

Hint: $|a + bi| = \sqrt{a^2 + b^2}$

7) $(-1)^{-\frac{21}{2}} =$ .... **2011-7 Eng**

(a) $-i$ (b) i (c) 1 (d) – 1

Hint: $(-1)^{\frac{-21}{2}} = (i^2)^{\frac{-21}{2}} = i^{-21} = i^{-1} = \frac{1}{i} = \frac{i}{i^2} = -i$

8) The roots of equation $25x^2 - 30x + 9 = 0$, are........ **2011-27 Eng**

(a) Imaginary **(b) rational and equal** (c) rational and unequal (d) irrational and equal

Hint: As $b^2 - 4ac = (-30)^2 - 4(25)(9) = 900 - 900 = 0 \Rightarrow$ the roots are rational and equal.

9) For what value of λ will the equation $x^2 - kx + 4 = 0$, have sum of roots equal to product of roots: **2011-34 Eng**

(a) 3 (b)– 2 (c) – 4 **(d) 4**

Hint: Sum of roots=Product of roots $\Rightarrow -\frac{-k}{1} = \frac{4}{1} \Rightarrow k = 4$

10) $x^2 + 3 =$ .... **2011-47 Eng**

(a) $(x + i\sqrt{3})(x - i\sqrt{3})$ (b) $(x - i\sqrt{3})(x - i\sqrt{3})$ (c) $(x + i\sqrt{3})(x + i\sqrt{3})$ (d) $(ix + \sqrt{3})(ix - \sqrt{3})$

Hint: $x^2 + 3 = x^2 - (-1)(\sqrt{3})^2 = x^2 - (i\sqrt{3})^2 = (x + i\sqrt{3})(x - i\sqrt{3})$

11) π in term of numbers is: **2011-134 Eng**

(a) a symbol (b) an integer (c) a rational number **(d) an irrational number**

Hint: π is the ratio of circumference of a circle to its diameter. It is an irrational number. Its approximate value is $\frac{22}{7}$ or 3.14

12) $\forall a, b \in$ the property either $a = b$ or $a > b$ or $a < b$ is called: **2011-137 Eng**

(a) Archimedean **(b) Trichotomy** (c) Closure (d) Transitive

13) $\omega^{12} + \omega^{58} + \omega^{95} =$ .... **2011-141 Eng**

(a) 0 (b) 1 (c) ω (d) – 1

Hint: $\omega^{12} + \omega^{58} + \omega^{95} = \omega^{12} + \omega^{57}\omega + \omega^{93}.\omega^2 = (\omega^3)^4 + (\omega^3)^{19}\omega + (\omega^3)^{31}\omega^2 = 1 + \omega + \omega^2 = 0$

14) The set $G=\{1, -1, i, -i\}$ is a group under: **2011-151 Eng**

(a) + (addition) (b) – (subtraction) **(c) × (multiplication)** (d) ÷ (division)

15) The compound proposition $(p\wedge q)\wedge\sim(p\vee q)$ is a……. **2011-154 Eng**

(a) Tautology (b) Sequence (c) Quantity **(d) Self-contradiction**

Hint: $(p\wedge q)\wedge\sim(p\vee q)\equiv(p\wedge q)\wedge(\sim p\wedge\sim q)$

Since $p\wedge q$ is true only if p and q are both true, while $(\sim p\wedge\sim q)$ is true only if both p and q are false, so $(p\wedge q)\wedge(\sim p\wedge\sim q)$ is always false. Hence $(p\wedge q)\wedge\sim(p\vee q)$ is self-contradiction.

16) The multiplicative inverse of a complex number (a, b) is: **2011-157 Eng**

(a) $\left(\frac{a}{a^2+b^2}, \frac{-b}{a^2+b^2}\right)$ (b) $\left(\frac{a}{a^2+b^2}, \frac{-b}{a^2-b^2}\right)$ (c) $\left(\frac{-a}{a^2+b^2}, \frac{b}{a^2+b^2}\right)$ (d) $\left(\frac{-a}{a^2+b^2}, \frac{-b}{a^2+b^2}\right)$

17) If $(1+3i)$ is one of the roots of the quadratic equation, than the equation is: **2011-161 Eng**

(a) $x^2-2x+10=0$ (b) $x^2+2x-10=0$ (c) $x^2-4x+8=0$ (d) $x^2-10=0$

Hint: If $\alpha=1+3i$, then $\beta=1-3i$, so $S=\alpha+\beta=1+3i+1-3i=2$ and $P=\alpha\beta=(1+3i)(1-3i)=10$

$\because x^2-Sx+P=0\Rightarrow x^2-2x+10=0$

18) Which of the following is correct? **2012-44 Eng**

(a) Sum of the cube roots of unity is 0 (b) Product of the cube roots of unity is 1

(c) Each complex cube root of unity is reciprocal of the other (d) All of the above

19) The concept of complex numbers as $a+ib$ was given by ……… **2012-48 Eng**

(a) Gauss (b) Newton (c) Archimedes (d) Leibniz

20) $\left(\frac{-1}{x}\right)^{-1}=$........ **2012-52 Eng**

(a) $\frac{1}{x}$ (b) x (c) $-\frac{1}{x}$ **(d) – x**

Hint: $\left(\frac{-1}{x}\right)^{-1}=\left(\frac{x}{-1}\right)^{1}=-x$

21) What will be the remainder when x^4+2x^3-2x-3, is divided by (x + 2) ? **2012-60 Eng**

(a) – 7 (b) – 23 (c) – 1 **(d) None**

Hint: $x-a=x+2\Rightarrow a=-2$, So $\text{Remainder}=P(a)=P(-2)=(-2)^4+2(-2)^3-2(-2)-3=1$

22) $|Z_1+Z_2|$ is: …… **2012-64 Eng**

(a) $=|Z_1|+|Z_2|$ (b) $\geq|Z_1|+|Z_2|$ (c) $=|Z_1||Z_2|$ **(d) $\leq|Z_1|+|Z_2|$**

23) The x + iy form of $(1-3i)^{-1}$ is: **2012-77 Eng**

(a) $\frac{1}{10}+\frac{3i}{10}$ (b) $-\frac{1}{10}-\frac{3i}{10}$ (c) $\frac{1}{3}+\frac{3i}{5}$ (d) $\frac{3}{10}-\frac{3i}{10}$

Hint: As $Z^{-1}=\frac{\overline{Z}}{|Z|^2}$, so $(1-3i)^{-1}=\frac{\overline{(1-3i)}}{|1-3i|^2}=\frac{1+3i}{1^2+(-3)^2}=\frac{1}{10}+\frac{3}{10}i$

24) Which of the following is a conditional equation? **2012-112 Eng**

(a) $(x+2)^3=x^3+6x^2+12x+8$ (b) $(x-5)^2=x^2-10x+25$

(c) $\sin^2\theta=1-\cos^2\theta$ **(d) x – 1 = 5**

Hint: An equation which is true for finite number of values of the variable(s) is called a conditional equation.

25) $ax^2+bx+c=0$ will **NOT** be a quadratic equation if: **2012-127 Eng**

(a) $b\neq 0, c=0$ (b) $a\neq 0, b=0$ **(c) a = 0** (d) b = 0

Hint: If $a=0$, $ax^2+bx+c=0$, becomes $bx+c=0$, which is linear and not quadratic

26) $-i^{48}=$......... **2012-146 Eng**

(a) i (b) –i **(c) –1** (d) 1

Hint: If r is the remainder obtained when an integer $n>3$ is divided by 4, then $i^n=i^r$ and $i^{-n}=i^{-r}$ where $0\leq r<4$.

Hence $-i^{48}=-i^0=-1$

27) Factors of $x^2 + 9$ are: **2012-149 Eng**

(a) (x + 3) (x – 3) **(b) $(x+3i)(x-3i)$** (c) (x – 3) (x – 3) (d) $(x+3i)(x+3i)$

Hint: $x^2+9=x^2-(-1)3^2=x^2-i^2 3^2=x^2-(3i)^2=(x+3i)(x-3i)$

28) $ax+\frac{b^2}{a}=c^2$ is: **2012-164 Eng**

(a) an equation of power 5 **(b) a linear equation** (c) a cubic equation (d) a quadratic equation

Hint: An equation in variable x is linear if the highest power of x in the equation is 1.

29) If A = {0} then the number of elements in the power set of A =...... **2012-170 Eng**

(a) 0 (b) 1 **(c) 2** (d) 3

Hint: If number of elements in a set $A=n$, then number of elements in the power set of A = 2^n

30) The quadratic equation whose roots are 3 and 4 is ……. **2012-196 Eng**

(a) $x^2-7x+12=0$ (b) $x^3 + 7x + 12$ (c) $x^3 + 12x + 7$ (d) $x^2 – 12x +$
7

Hint: Here, $S=3+4=7,\ P=3\times4=12$, so $x^2-Sx+P=0\Rightarrow x^2-7x+12=0$

31) The sum of the squares of two numbers is 100.One number is 2 more than the other. The numbers are:
2013-3 Eng

(a) 4, 6 **(b) 6, 8** (c) 8, 10 (d) 10, 12

Hint: Let the numbers are x and $x+2$, then $x^2+(x+2)^2=100\Rightarrow 2x^2+4x-96=0\Rightarrow x^2+2x-48=0$

$\Rightarrow(x+8)(x-6)=0\Rightarrow x=-8,\ 6$. If we take $x=6$, then $x+2=8$

32) A groupoid (S, *) is called a semi group, if '*' is: **2013-6 Eng**

(a) Commutative in S **(b) Associative in S** (b) Distributive in S (d) Transitive in S

33) If $a, b, c\in$ and $a>b>c\Rightarrow a>c$, then this property is called: **2013-23 Eng**

(a) Multiplicative property of inequality (b) Additive property of inequality
(c) **Transitive property of inequality** (d) Trichotomy property of inequality

34) If A and B are two sets, then $A'\cup B'=$.......... **2013-53 Eng**

(a) $(A\cup B)'$ **(b) $(A\cap B)'$** (c) $A'\cap B'$ (d) $(B\cup A)'$

Hint: By De-Morgan's law, $A'\cup B'=(A\cap B)'$

35) Let Z be the set of all integers and "o" is defined as, $a\circ b=3a-b$, where a, b ∈ Z, then "o" is not:
2013-59 Eng

(a) Commutative (b) Associative (c) Distributive **(d) All of the above**

36) In the quadratic equation $ax^2+bx+c=0$,, product of the roots is: **2013-69 Eng**

(a) $\frac{b}{a}$ (b) $\frac{c}{a}$ **(c) $\frac{c}{a}$** (d) $\frac{-b}{a}$

37) In the quadratic equation, $ax^2+bx+c=0$, if a= 0, then it: **2013-76 Eng**

(a) Becomes a linear equation (b) Becomes a polynomial
(c) Becomes an exponential equation (d) Remains quadratic equation

38) The numbers which have $\sqrt{-1}$ as one factor are called: **2013-83 Eng**

(a) Real numbers (b) Complex numbers (c) Irrational numbers **(d) Imaginary numbers**

39) The roots of the equation $25x^2-30x+9=0$ are: **2013-96 Eng**

(a) Imaginary **(b) Rational and equal** (c) Rational and unequal (d) Irrational and equal

Hint: For, $25x^2-30x+9=0$, we have $a=25, b=-30, c=9$. Since $b^2-4ac=(-30)^2-4(25)(9)=900-900=0$

So the roots are rational and equal.

40) For what value of k will equation, $x^2 - kx + 4 = 0$, have the sum of roots equal to the product of roots? **2013-109 Eng**

(a) 3 (b) −2 (c) −4 **(d) 4**

Hint: Sum of roots=Product of roots $\Rightarrow \frac{-b}{a} = \frac{c}{a} \Rightarrow \frac{-(-k)}{1} = \frac{4}{1} \Rightarrow k = 4$

41) The product of the fourth roots of unity is: **2013-113 Eng**

(a) Zero (b) 1 **(c) −1** (d) $-i$

Hint: $1(-1)(i)(-i) = i^2 = -1$

42) Which of the following sets has closure property with respect to multiplication? **2013-119 Eng**

(a) $\{-1, 1\}$ (b) $\{-1\}$ (c) $\{-1, 0\}$ (d) $\{0, 2\}$

Hint: $(-1)(-1) = 1,\ (-1)(1) = -1,\ 1\times1 = 1$

43) If A and B are two sets, Then $A' \cap B' =$ .... **2014-4 Eng**

(a) $(A\cap B)'$ (b) $A' \cup B'$ **(c) $(A\cup B)'$** (d) $(B\cap A)'$

Hint: By De-Morgan`s Law, $A' \cap B' = (A\cup B)'$

44) Modulus of complex number $4 - 3i$ is: **2014-6 Eng**

(a) −5 (b) 7 (c) 1 **(d) 5**

Hint: $|4-3i| = \sqrt{4^2 + (-3)^2} = \sqrt{16+9} = \sqrt{25} = 5$

45) The Concept of complex numbers as $a+bi$ was given in 1795 by: ______ **2014-15 Eng**

(a) Gauss (b) Archimedes (c) George Cantor (d) Rene Descartes

46) $(-1)^{-\frac{31}{2}}$ is equal to: **2014-16 Eng**

(a) $-i$ **(b) i** (c) 1 (d) −1

Hint: $(-1)^{\frac{-31}{2}} = (i^2)^{\frac{-31}{2}} = i^{-31} = i^{-3} = \frac{1}{i^3} = \frac{i}{i^4} = i$

47) Which of the following is false? **2014-24 Eng**

(a) The cancellation laws hold in a group (b) Each element in a group has a unique inverse.

(c) A group can be an empty group (d) None of the above

48) If α and β are the roots of the equation, $5x^2 + 5x + 4 = 0$, then $\alpha\beta =$ .... **2014-25 Eng**

(a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) $\frac{2}{3}$ (d) −1

Hint: For $5x^2 + 5x + 4 = 0$, we have $a = b = 5,\ c = 4$ and Product of roots $= \alpha\beta = \frac{c}{a} = \frac{4}{5}$

49) For what value of k will equation, $x^2 + kx - 5 = 0$, have the sum of roots equal to the product of roots? **2014-34 Eng**

(a) 3 (b) −5 (c) −2 **(d) 5**

Hint: For $x^2 + kx - 5 = 0$, we have $a = 1,\ b = k,\ c = -5$. As $\alpha + \beta = \alpha\beta \Rightarrow \frac{-b}{a} = \frac{c}{a} \Rightarrow \frac{-k}{1} = \frac{-5}{1} \Rightarrow k = 5$

50) Which of the following is not a quadratic equation? **2014-36 Eng**

(a) $5x^2 + 3x = 0$ (b) $3x^2 - 37 = 0$ (c) $x + 3 = \frac{5}{x}$ **(d) $3 - \frac{1}{x} = 5$**

Hint: A 2nd degree equation is called quadratic. The equation $3 - \frac{1}{x} = 5 \Rightarrow \frac{1}{x} = -2 \Rightarrow x = -\frac{1}{2}$, is not quadratic.

51) Which of the following sets has closure property w.r.t multiplication? **2014-54 Eng**

(a) $\{-1\}$ (b) $\{-1, 0\}$ (c) $\{0, 2\}$ **(d) $\{-1, 0, +1\}$**

Hint: From the table, it is clear that $\{-1, 0, +1\}$ is closed w.r.t $\times$.

$\times$	-1	0	1
-1	1	0	-1
0	0	0	0
1	-1	0	1

52) The sum of the squares of two numbers is 65. The sum of two umbers is 11. The numbers are : **2014-55 Eng**

(a) 2, 9 **(b) 4, 7** (c) 3, 8 (d) 5, 6

Hint: Let one number = x, then the other number = 11 − x. According to the given condition, we have

$x^2+(11-x)^2=65 \Rightarrow 2x^2-22x+121=65 \Rightarrow 2x^2-22x+56=0 \Rightarrow x^2-11x+28=0 \Rightarrow x^2-7x-4x+28=0$

$\Rightarrow x(x-7)-4(x-7)=0 \Rightarrow (x-7)(x-4)=0 \Rightarrow x=4, 7$

53) The reflective property of equality of real numbers is that , $\forall a \in \mathbb{R}$ **2014-56 Eng**

(a) $a=a$ (b) $a \neq a$ (c) $a \leq a$ (d) $a \geq a$

54) Let "*" and "o" be the two binary operations in a non-empty sets S. The operation "*" is said to be left distributive over "o" if: **2014-74 Eng**

(a) $\mathbf{a*(boc)=(a*b)o(a*c)}$ (b) (b o c) * a = (b * a) o (a * c)

(c) ao (b *c) = (ao b) * (a o c) (d) (b * c) o a = (b o a) o (a o c)

55) Which of the following is not property of fourth roots of unity? **2014-76 Eng**

(a) Complex fourth roots of unity are conjugate of each other.

(b) Sum of the fourth roots of unity is 0.

(c) Product of fourth roots of unity is 1.

(d) Real fourth roots of unity are additive inverse of each other.

Hint: $1(-1)(i)(-i)=i^2=-1 \neq 1$

56) Which of the following is a factor of $x^3 + 2x^2 - 5x - 6$? **2014-84 Eng**

(a) x − 1 **(b) x − 2** (c) x + 2 (d) x − 3

Hint: Here $P(x)=x^3+2x^2-5x-6 \Rightarrow P(2)=2^3+2(2)^2-5(2)-6=0 \Rightarrow x-2$ is a factor of $P(x)$

57) The quadratic equation having 3, −4 as its roots is: **2014-85 Eng**

(a) $\mathbf{x^2-x+12=0}$ (b) $x^2 - x - 12= 0$ (c) $x^2 + x + 12= 0$ (d) $x^2 - x + 12= 0$

Hint: Here $S=3+(-4)=-1, P=(3)(-4)=-12$. Hence, $x^2-Sx+P=0 \Rightarrow x^2+x-12=0$

58) Roots of $x^2 - x - 12= 0$ are: **2014-86 Eng**

(a) unequal and complex (b) Equal and real (c) unequal and irrational **(d) Unequal and rational**

Hint: Here $a=1, b=-1, c=-12$ and $b^2-4ac=(-1)^2-4(1)(-12)=1+48=49=7^2 \Rightarrow$ roots are unequal and rational

59) For any complex number z, $Z\overline{Z}=$.......... **2015-74 Eng**

(a) $\overline{Z}Z$ (b) $|Z|^2$ (c) $|\overline{Z}|^2$ **(d) All of the above**

Hint: Let $z=x+iy$,then $\overline{Z}=x-iy$ .Now $Z.\overline{Z}=\overline{Z}.Z=(x-iy)(x+iy)=x^2+y^2=\left(\sqrt{x^2+y^2}\right)^2=|Z|^2=|Z^2|$

60) If $Z=a+ib$, then $Z\overline{Z}=$.......... **2015-80 Eng**

(a) $\sqrt{a^2+b^2}$ (b) $\sqrt{a^2-b^2}$ **(c)** $\mathbf{a^2+b^2}$ (d) $-(a^2+b^2)$

Hint: $\forall Z=(a+ib) \in \mathbb{C}$, $Z.\overline{Z}=|Z|^2=\left(\sqrt{a^2+b^2}\right)^2=a^2+b^2$

61) $\forall Z_1, Z_2 \in \mathbb{C}$, $\overline{Z_1-Z_2}=$....... **2015-130 Eng**

(a) $\overline{Z_1}+\overline{Z_2}$ **(b)** $\mathbf{\overline{Z_1}-\overline{Z_2}}$ (c) $\overline{Z_1}.\overline{Z_2}$ (d) $\overline{Z_2-Z_1}$

62) Multiplicative inverse of $-2-3i$ is: 2016-04

(a) $-\frac{2}{13}+\frac{3}{13}i$ (b) $\frac{2}{13}-\frac{3}{13}i$ (c) $-\frac{2}{13}-\frac{3}{13}i$ (d) All of the above

1. B	9. D	17. A	25. C	33. C	41. C	49. D	57. A
2. B	10. A	18. C	26. C	34. B	42. A	50. D	58. D
3. C	11. D	19. A	27. B	35. D	43. C	51. D	59. D
4. C	12. B	20. D	28. B	36. C	44. D	52. B	60. C
5. A	13. A	21. D	29. C	37. A	45. A	53. A	61. B
6. B	14. C	22. D	30. A	38. D	46. B	54. A	62. A
7. A	15. D	23. A	31. B	39. B	47. C	55. C	
8. B	16. A	24. D	32. B	40. D	48. A	56. B	

CHAP NO 2 MATRICES & DETERMINANTS

I) If A = $\begin{bmatrix} 2 & \lambda \\ 3 & 1 \end{bmatrix}$ is a non cellular matric, then can takes/ all the real values except for : 2017

a)0 b)2/3 c)-2/3 d)3/2

ans: c

II) If det($A+^{-1}$) = 5, then det(A) = 2018

a)5 b)-5 c)1/5 d)-1/5

ans: c

III) For a square matrix A = [A_{ij}, the condition a_{ij}= O $\forall\, i \neq j$ and a_{ij} = -1, $\forall$ i=j holds for; 2018

a)diognal matrix b)unit matrix c) scalar matrix d) skew-symmetric

ans: a

61) If A, B, C are conformable for multiplication, then $(ABC)^t$ =........ **2010-63 Eng**

(a) $\mathbf{C^tB^tA^t}$ (b) $B^tC^tA^t$ (c) $A^tB^tC^t$ (d) $B^tA^tC^t$

Hint: Transpose reverse the order of matrices in matrix multiplication, so $(ABC)^t = C^tB^tA^t$

62) Let A be a matrix of order $n\times n$, then $|A| =$ ...... **2010-124 Eng**

(a) $|-A|$ (b) $|A^{-1}|$ (c) $|\mathbf{A^t}|$ (d). None

Hint: For any square matrix A, we have $|A| = |A^t|$

63) The transpose of a row matrix is a .... **2010-170 Eng**

(a) Column matrix (b) Row matrix (c) Square matrix (d) None of the above

Hint: The transpose of a matrix is obtained by interchanging rows into columns, so the transpose of a row matrix is a column matrix.

64) If $\begin{vmatrix} k-2 & 1 \\ 5 & k+2 \end{vmatrix} = 0$, then k = **2011-17 Eng**

(a) 0 (b) 3 (c) -3 (d) ± 3

Hint: $\begin{vmatrix} k-2 & 1 \\ 5 & k+2 \end{vmatrix} = 0 \Rightarrow (k-2)(k+2)-5=0 \Rightarrow k^2-4-5=0 \Rightarrow k^2=9 \Rightarrow k=\pm 3$

65) The co-factor of an element a_{ij} denoted by A_{ij} is: ________ **2011-21 Eng**

(a) $(-1)^{ij}M_{ij}$ (b) $\mathbf{(-1)^{i+j}M_{ij}}$ (c) $(-1)^{i-j}M_{ij}$ (d) $(1)^{i+j}M_{ij}$

66) Let A and B any two matrices of the same order then $(A+B)^t$ =....... **2011-167 Eng**

(a) $A^t - B^t$ **(b)** $\mathbf{A^t + B^t}$ (c) $A + B^t$ (d) $A^t + B$

67) For a given matrix A , if $|A| \neq 0$, then $(A^{-1})^t$ =........... **2012-54 Eng**

(a) $(A^t)^{-1}$ (b) (A^{-1}) (c) $(A^{-1})^{-1}$ (d) $(A^t)^{-t}$

68) Order of a matrix A is $p \times q$, order of matrix B = $q \times r$, then the order of matrix $C = A \times B$ will be…… **2012-83 Eng**

(a) $p \times r$ (b) $p \times q$ (c) $q \times r$ (d) $r \times p$

69) If C and D are two matrices, then $(C+D)^t =$ .... **2013-16 Eng**

(a) $\mathbf{C^t + D^t}$ (b) C^tD^t (c) D^tC^t $(CD)^t$

70) If a system of linear equations has no solution, it is called: **2013-33 Eng**

(a) Invertible (b) Indeterminate (c) Consistent **(d) Inconsistent**

71) If A is a non-singular matrix, then $A^{-1} =$ .... **2013-56 Eng**

(a) $\frac{1}{|A|}$ adj A (b) $A^{-1}\text{adj}A$ (c) $\frac{1}{A^{-1}}\text{adj}A$ (d) $\frac{|A|}{\text{adj}A}$

Hint: $A^{-1} = \frac{1}{|A|}\text{adj}A$

72) If A is a square matrix of order 3x3, then AA^t is: **2013-86 Eng**

(a) Symmetric (b) Skew-symmetric (c) Triangular (d) None of the above

Hint: $(AA^t)^t = (A^t)^t A^t = AA^t \Rightarrow$ A is symmetric matrix

73) Identity matrix is always: **2014-64 Eng**

(a) Rectangular (b) Skew-symmetric (c) Singular (d) Non-singular

Hint: Let I_n be an identity matrix of order n, then $\det(I_n) = |I_n| = 1 \neq 0 \Rightarrow I_n$ is non-singular

74) The matrix $\begin{bmatrix} 0 & 1-2i \\ -1-2i & 0 \end{bmatrix}$ is : **2014-75 Eng**

(a) Hermitian Matrix (b) Skew Hermitian Matrix
(c) Symmetric Matrix (d) Skew Symmetric Matrix

Hint: $(\overline{A})^t = -A \Rightarrow A$ is skew-hermition matrix

75) If any two rows or two columns in a square matrix A are interchanged, then the determinant of the resulting matrix is:

(a) $|A|$ (b) $|A-2|$ (c) $|A|^{-1}$ (d) $-|A|$ **2015-2 Eng**

76) A square matrix $M = [a_{ij}]$ of order n with complex entries. If $(\overline{M})^t = -M$, then which is correct? **2015-36 Eng**

(a) M is skew-hermition (b) $\overline{a_{ij}} = -a_{ji}$, for $i, j = 1, 2, 3, ..., n$
(c) M is Anti-hermition (d) All of the above

77) Generally $B - B^t$ is a: **2015-168 Eng**

(a) Symmetric matrix (b) Skew-symmetric matrix (c) Singular matrix (d) Additive inverse

Hint: $(B-B^t)^t = B^t - (B^t)^t = B^t - B = -(B-B^t) \Rightarrow B - B^t$ is skew-symmetric matrix.

Answer Key

61. (a)
62. (c)
63. (a) Column matrix
64. (d) +3
65. (b)
66. (b)
67. (a)
68. (a) $p \times r$
69. (a)
70. (a)
71. (a) adj A
72. (a) Symmetric
73. (d) Non-singular
74. (b) Skew Hermitian Matrix
75. (d)
76. (d) All of the above
77. (b) Skew-symmetric matrix

CHAP NO 3 VECTORS

I) If $|\vec{a}+\vec{b}| = |\vec{a}-\vec{b}|$ for two non zero vectors $\vec{a}$ and $\vec{b}$, then it holds that **2017**
a) $\vec{a}$ and $\vec{b}$ are perpendicular b) $\vec{a}$ and $\vec{b}$ are parallel
c) $\vec{a}$ and $\vec{b}$ are coplanar d)all values except t=0
ans: a

II) Let $\vec{G}(t) = t\vec{i} - (t+1)^{+2}\vec{j} + t^{-1}\vec{k}$ **2017**
a)all values of t b)only non negatives values of t
c)all positive values of t d)all values except t=0
ans; d

III) If a,b, and c are three non zero vectors, then the expression a.(b.c) is: **2018**
a)scalar triple product b)volume of parallelepiped
c)dot product d) meaningless
ans:

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79) If the scalar product of two non-zero vectors $\vec{A}$ and $\vec{B}$ is zero then the magnitude of their vector product will be: **2010-65 Eng**
(a) AB (b) Zero (c) $AB\sin\theta$ (d) $AB\cos\theta$

Hint: $\vec{A}.\vec{B} = AB\cos\theta = 0 \Rightarrow \theta = 90°$, so $|\vec{A}\times\vec{B}| = AB\sin 90° = AB$

---

80) If the vectors $m\vec{a}+n\vec{b}$ and $p\vec{a}+q\vec{b}$ are parallel then: **2010-66 Eng**
(a) $m=p, n=q$ (b) $m+n=p+q$ (c) $\frac{m}{p}=\frac{n}{q}$ (d) None

Hint: $\left(m\vec{a}+n\vec{b}\right) \parallel \left(p\vec{a}+q\vec{b}\right) \Rightarrow m\vec{a}+n\vec{b} = k\left(p\vec{a}+q\vec{b}\right) \Rightarrow m = kp,\ n = kq \Rightarrow \frac{m}{p} = k = \frac{n}{q} \Rightarrow \frac{m}{p} = \frac{n}{q}$

---

81) The vector produce of vector $\vec{a}$ by itself is: **2010-19 Eng**
(a) 1 (b) Zero (c) −1 (d) Null vector

Hint: $\vec{a}\times\vec{a} = |\vec{a}|^2 \sin 0\ n = \vec{0}$

---

82) Let $\overrightarrow{OP} = \vec{a}$ and $\overrightarrow{OR} = \vec{b}$, then $\overrightarrow{PR} = \ldots\ldots$ **2010-129 Eng**
(a) $\vec{a}-\vec{b}$ (b) $\vec{b}-\vec{a}$ (c) $\vec{a}+\vec{b}$ (d) None

Hint: $\overrightarrow{PR} = \overrightarrow{OR} - \overrightarrow{OP} = \vec{b} - \vec{a}$

---

83) If $\vec{A} = \hat{i}+\hat{k}$ and $\vec{B} = \hat{i}+\hat{j}$, Then the angle between $\vec{A}$ and $\vec{B}$ **2011-13 Eng**
(a) 60° (b) 75° (c) 45° (d) 30°

Hint: $\vec{A} = \hat{i}+\hat{k} = [1, 0, 1], \vec{B} = \hat{i}+\hat{j} = [1, 1, 0]$, so $\theta = \cos^{-1}\left(\frac{1.1+0.1+1.0}{\sqrt{1^2+0^2+1^2}.\sqrt{1^2+1^2+0^2}}\right) = \cos^{-1}\left(\frac{1}{2}\right) = 60°$

---

84) If $\vec{A}.\vec{B} = 0$, then $\vec{A}\times\vec{B}$ will be equal to: **2011-16 Eng**
(a) ABn (b) Zero (c) $AB\sin\theta n$ (d) $AB\cos\theta$

Hint: As $\vec{A}.\vec{B} = AB\cos\theta = 0 \Rightarrow AB = 0$, so $\vec{A}\times\vec{B} = AB\sin\theta n = (0)\sin\theta.n = \vec{0}$

---

85) Cosine of the angle between two non zero vectors $\vec{a}$ and $\vec{b}$ is: **2011-101 Eng**
(a) $\frac{\vec{a}.\vec{b}}{|\vec{a}||\vec{b}|}$ (b) $\frac{|\vec{a}||\vec{b}|}{\vec{a}.\vec{b}}$ (c) $\frac{\vec{a}\times\vec{b}}{|\vec{a}||\vec{b}|}$ (d) $\vec{a}.\vec{b}$

Hint: If θ be the angle between two non-zero vectors $\vec{a}$ and $\vec{b}$, then cosine of θ is $\cos\theta = \frac{\vec{a}.\vec{b}}{|\vec{a}||\vec{b}|}$

---

86) $\hat{j}.(k \times \hat{i}) =$ **2011-107 Eng**

(a) 1 (b) $\hat{i}$ (c) $\hat{j}$ (d) k

Hint: $\hat{j}.(k \times \hat{i}) = \hat{j}.\hat{j} = 1$

---

87) Magnitude of the vector $\vec{a}$ = (i – j) + (j – i) + (k – j) is…….. **2011-144 Eng**

(a) $\sqrt{3}$ (b) $\sqrt{2}$ (c) $2\sqrt{2}$ (d) $2\sqrt{3}$

Hint: $\vec{a} = (i-j)+(j-i)+(k-j) = k-j \Rightarrow |\vec{a}| = |k-j| = \sqrt{1^2+(-1)^2} = \sqrt{2}$

---

88) Two or more vectors are said to be collinear if they are: **2012-25 Eng**

(a) Intersecting the same line (b) Parallel to the same line
(c) Perpendicular to the same line (d) Both a. and c.

---

89) Which one of the following is scalar quantity ? **2012-42 Eng**

(a) Mass (b) acceleration (c) Momentum (d) electric intensity

Hint: The physical quantity which has magnitude only is called scalar quantity.

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90) If $\vec{a}$ and $\vec{b}$ are non-collinear vectors then $p\vec{a} + q\vec{b} = \vec{0}$ implies: **2012-101 Eng**

(a) $p \neq 0$, $q \neq 0$ (b) $p = q = 0$ (c) $p \neq 0$, $q = 0$ (d) $P = 0$, $q \neq 0$

---

91) Let $\vec{a}$ and $\vec{b}$ be any two vectors and θ be the angle between them, then $|\vec{b}|\cos\theta$ is protection of:
2012-122 Eng

(a) $\vec{b}$ in the direction of $\vec{a}$ (b) $\vec{a}$ in the direction of $\vec{b}$

(c) $\vec{b}$ in the direction of $x-$axis (d) $\vec{a}$ is in the direction of $y-$axis

---

92) Which of the following pairs contains one vector and one scalar quantity? **2013-35 Eng**

(a) Displacement, acceleration (b) Force, kinetic energy
(c) Momentum, velocity (d) Power, speed

Hint: $\vec{F} = m\vec{a}$ and $K.E = \frac{1}{2}mv^2$

---

93) If $\vec{a}.(\vec{b}+\vec{c}) = \vec{a}.\vec{b} + \vec{a}.\vec{c}$, then: **2013-176 Eng**

(a) Vector product is distributive over multiplication
(b) Scalar product is distributive over multiplication
(c) Vector product is associative over addition
(d)Scalar product is distributive over addition

---

94) If $\vec{a}$ and $\vec{b}$ are parallel vectors but opposite in direction and θ = 180°, then $\vec{a}.\vec{b}$ = ...
2013-196 Eng

(a) 1 (b) –1 (c) – ab (d) ab

Hint: $\vec{a}.\vec{b} = ab\cos\theta = ab\cos 180° = ab(-1) = -ab$

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95) If $||\vec{a}| = 3$, $|\vec{b}| = 4$ and θ = 60°, then $\vec{a}.\vec{b}$ = ... **2013-199 Eng**

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) 6 (d) 2

Hint: $\vec{a}.\vec{b} = |\vec{a}||\vec{b}|\cos\theta = 3(4)b\cos 60° = \frac{12}{2} = 6$

---

96) A Vector which is used to represent the direction of a given vector is called: **2014-145 Eng**

(a) Position vector (b) Unit vector (c) Null vector (d) Zero vector

97) A vector is called zero vector if: **2014-166 Eng**

(a) It has magnitude and no arbitrary direction.
(b)It has no magnitude but has arbitrary direction.
(c) It has only magnitude and direction
(d) It has direction only.

98) Let $\vec{a}$ and $\vec{b}$ be the position vectors of the point A and B. If C divides $\overline{AB}$ internally in the ratio p : q ,then the position vector $\vec{c}$ of C is given by: **2014-174 Eng**

(a) $\vec{c} = \frac{q\vec{b}+p\vec{a}}{q+p}$ (b) $\vec{c} = \frac{q\vec{b}+p\vec{a}}{q-p}$ (c) $\vec{c} = \frac{q\vec{b}-p\vec{a}}{q+p}$ (d) $\vec{c} = \frac{\vec{a}q+\vec{b}p}{q+p}$

99) If $\vec{a}.\left(\vec{b}+\vec{c}\right)=\vec{a}.\vec{b}+\vec{a}.\vec{c}$, then **2014-175 Eng**

(a) Scalar product is distributive over addition
(b) Scalar product is distributive over multiplication.
(c) Vector product is distributive over multiplication.
(d) Vector product is associative over addition.

100) Gives the vectors $\vec{a} = a_1i + a_2i + a_3k$ and $\vec{b} = = b_1i + b_2i + b_3k$, the vector product $\vec{a}\times\vec{b} =$ can be written in determinant
form as: **2014-176 Eng**

(a) $\begin{vmatrix} i & j & k \\ a_1 & b_1 & a_3 \\ a_2 & b_2 & a_3 \end{vmatrix}$ (b) $\begin{vmatrix} i & j & k \\ a_1 & b_1 & b_2 \\ a_2 & b_1 & b_3 \end{vmatrix}$ (c) $\begin{vmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ \mathbf{a_1} & \mathbf{a_2} & \mathbf{a_3} \\ \mathbf{b_1} & \mathbf{b_2} & \mathbf{b_3} \end{vmatrix}$ (d) $\begin{vmatrix} i & j & k \\ b_1 & b_3 & b_2 \\ a_1 & b_3 & b_2 \end{vmatrix}$

101) If $\left|\vec{a}\right| = 3$, $\left|\vec{b}\right| = 4$ and $\theta = 60°$ than $\vec{a}.\vec{b} =$......... **2014-185 Eng**

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) 2 (d) 6

Hint: $\vec{a}.\vec{b} = \left|\vec{a}\right|\left|\vec{b}\right|\cos\theta = (3)(4)\cos 60° = 12\times\frac{1}{2} = 6$

102) Two vectors $\vec{A}$ and $\vec{B}$ are such that $\vec{A}+\vec{B}=\vec{C}$ and $A^2+B^2=C^2$. If θ is the angle between positive direction of $\vec{A}$ and $\vec{B}$, then θ is:
2015-69 Eng

(a) $\theta=0$ **(b)** $\boldsymbol{\frac{\pi}{2}}$ (c) $\theta=\frac{\pi}{3}$ (d) $\theta=\pi$

Hint: $\left(\vec{A}+\vec{B}\right).\left(\vec{A}+\vec{B}\right)=\vec{C}.\vec{C} \Rightarrow A^2+B^2+2\vec{A}.\vec{B}=C^2 \Rightarrow C^2+2\vec{A}.\vec{B}=C^2 \Rightarrow 2\vec{A}.\vec{B}=0 \Rightarrow \vec{A}.\vec{B}=0 \Rightarrow \vec{A}\perp\vec{B}$

103) If n is a unit vector in the direction of $\vec{A}$, then **2015-103 Eng**

(a) $\mathbf{n} = \frac{\vec{A}}{\left|\vec{A}\right|}$ (b) $n = \left|\vec{A}\right|\vec{A}$ (c) $n = \frac{\left|\vec{A}\right|}{\vec{A}}$ (d) $n = n.\vec{A}$

104) The initial point of the vector $\vec{r} = (-2, -1, 2)$ for the terminal point $(4, -1, -2)$ is: **2015-113 Eng**

(a) $(2, 1, -2)$ (b) $(-4, 1, 2)$ (c) $\mathbf{(6, 0, -4)}$ (d) $(-6, 0, 4)$

Hint: Here, terminal point = $B=(4,-1,-2)$. Let initial point = $A=(x, y, z)$, then

$\overrightarrow{AB} = \vec{r} \Rightarrow (4-x, -1-y, -2-z) = (-2, -1, 2) \Rightarrow (x, y, z) = (6, 0, -4)$

105) Area of triangle having vertices $A(2, 2, 0)$, $B(-1, 0, 2)$, $C(0, 4, 3)$ is: **2015-114 Eng**

(a) 30 (b) 15 (c) $\mathbf{\frac{15}{2}}$ (d) 16

Hint: $\overrightarrow{AB} = (-1, 0, 2) - (2, 2, 0) = (-3, -2, 2)$ and $\overrightarrow{AC} = (0, 4, 3) - (2, 2, 0) = (-2, 2, 3)$, $\Delta = \frac{1}{2}\left|\overrightarrow{AB} \times \overrightarrow{AC}\right|$

---

106) For any two vectors $\vec{a}$ and $\vec{b}$ making an angle θ between them, then $\vec{a}.\vec{b} = 0$, if and only if:

(a) $\vec{a} \perp \vec{b}$ (b) $\theta = \frac{\pi}{2}$ (c) Either $\vec{a} = \vec{0}$ or $\vec{b} = \vec{0}$ (d) All of the above

Answers

79. (a) AB
80. (c)
81. (d) Null vector
82. (b)
83.(a) 60o
84.(b) Zero
85. (a)
86. (a) 1
87. (b)
88. (b) Parallel to the same line
89. (a) Mass
90. (b) p = q = 0
91. (a) in the direction of
92.(b) Force, kinetic energy
93.(d)Scalar product is distributive over addition
94.(c) –ab
95. (c) 6
96.(b) Unit vector
97. (b)It has no magnitude but has arbitrary direction.
98. (d)
99. (a) Scalar product is distributive over addition
100. (c)
101. (d) 6
102. (b)
103. (a)
104. (c)
105. (c)
106. (d) All of the above

CHAP NO 4 SEQUENCES

I) The n^{th} term formula for 2,3,5,6,11…………..is **2018**
a)2n-1 b)2n+1 c)a_n d) non of the above
ans; D

II) If G1, G2,G3 and G4 are four geometric means between two numbers aand b then $(G1,G2,G3,G4)^4$ = _____ **2018**
A)G^4 B)$G^{1/4}$ C) G^8 D)G^{16}
Ans: d

III) If a_{10} = x, and a_{12} = y and a_{16} =z, are terms of G,P then; **2018**
a)x,y = z^2 b) x,z = y^2 c) y,z = x^2 d)x,y = z
ans: A

IV) The common ration of the geometric sequence $\{a_n\} = 2^{-n}$ is given by: **2017**
a) 2 b)1/2n c) ½ d)-½
ans: C

V) A sequenc is a function , whose domain is set of:
a)real numbers b)natural numbes c) integers d)positive
ans: b

---

1) $\sum_{j=1}^{\infty} \frac{1}{2^j} =$ **2010-36 Eng**

(a) 1 (b) ∞ (c) $\frac{1}{2}$ (d) $\frac{1}{2^n}$

Hint: $\sum_{j=1}^{\infty} \frac{1}{2^j} = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots \infty = \frac{1/2}{1-1/2} = \frac{1/2}{1/2} = 1$ $\left(\because S_\infty = \frac{a}{1-r}\right)$

2) Harmonic means between 3 and 7 is: **2011-51 Eng**

(a) $\frac{5}{21}$ (b) $\mathbf{\frac{21}{5}}$ (c) 5 (d) $\sqrt{21}$

Hint: $\text{H.M} = \frac{2ab}{a+b} = \frac{2(3)(7)}{3+7} = \frac{42}{10} = \frac{21}{5}$

3) The sum of an infinite G.P is 4 and the sum of the cubes of its terms is 92. The common ratio of the original G.P is: **2011-181 Eng**

(a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\mathbf{-\frac{1}{2}}$

Hint: Given that, $a + ar + ar^2 + \cdots = \frac{a}{1-r} = 4 \Rightarrow \frac{a^3}{(1-r)^3} = 64 \longrightarrow (i)$ and

$a^3 + a^3r^3 + a^3r^6 + \cdots = \frac{a^3}{1=r^3} = 192 \longrightarrow (ii)$

$(ii) \div (i) \Rightarrow \frac{1-2r+r^2}{1+r+r^2} = 3 \Rightarrow 2r^2 + 5r + 2 = 0 \Rightarrow r = -2, -\frac{1}{2}$. Since $|r| = |-2| = 2 > 1$, so $r = -2$ is not possible.

Hence $r = -\frac{1}{2}$

4) If $x > 0,\ xy = 1$, then minimum value of x + y is: **2011-184 Eng**

(a) 2 (b) -2 (c) 1 (d) -1

Hint: As $\text{G.M} \le \text{A.M} \Rightarrow \frac{x+y}{2} \le \sqrt{xy} = \sqrt{1} = 1 \Rightarrow x + y \le 2 \Rightarrow$ minimum value of $x+y$ is 2

5) In a G.P if $a_{10} = \ell,\quad a_{13} = m,\quad a_{16} = n$, then **2011-194 Eng**

(a) $\mathbf{\ell n = m^2}$ (b) $\ell n = n^2$ (c) $mn = \ell^2$ (d) $mn = \ell$

Hint: $\left.a_{10} = \ell = ar^9,\ m = ar^{12},\ n = ar^{15}\right\} \Rightarrow \ell n = m^2$

6) In an A.P if $a_1 = 4$, $a_{10} = 22$, then $a_{15} = ?$ **2012-41 Eng**

(a) 30 (b) 32 (c) 33 (d) 56

Hint: As $a_{10} = a_1 + 9d \Rightarrow 22 = 4 + 9d \Rightarrow d = 2$. Hence $a_{15} = a_1 + 14d = 4 + 14(2) = 4 + 28 = 32$

7) If $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ be an A.M between a and b then $n = \ldots\ldots\ldots\ldots$ **2012-134 Eng**

(a) -2 (b) 0 (c) 1 (d) -1

Hint: For $n = 0$, $\frac{a^{n+1}+b^{n+1}}{a^n+b^n} = \frac{a^{0+1}+b^{0+1}}{a^0+b^0} = \frac{a^1+b^1}{1+1} = \frac{a+b}{2}$, which is an A.M between a and b.

8) $\frac{1}{10}, \frac{1}{14}, \frac{1}{18}, \ldots\ldots\ldots$ is ……… **2012-13Eng**

(a) Geometric sequence (b) Arithmetic sequence
(c) Asymptotic sequence (d) Harmonic sequence

Hint: Since 10, 14, 18, 22,⋯⋯ is an A.P, so $\frac{1}{10}, \frac{1}{14}, \frac{1}{18}, \frac{1}{22}, \cdots\cdots$ is an H.P

9) If A,G and H be respectively the A.M, G.M and H.M between a and b, then which of the following relation is correct? **2012-140 Eng**

(a) $\mathbf{G^2 = A.H}$ (b) $G > A > H$ (c) $H > A > G$ (d) $A < G < H$

Hint: For A, G, H, we have $G^2 = A.H$ and $A > G > H$

10) A sequence is a function whose domain is: **2012-155 Eng**

(a) □ (b) □ (c) W (d) □

11) If a, $G_1, G_2, G_3, \ldots. G_n$, b is a G.P, then $G_n = \ldots\ldots$ **2012-159 Eng**

(a) $b\left(\frac{a^n}{b^{n-1}}\right)^{\frac{n}{n+1}}$ (b) $b\left(\frac{a}{b}\right)^{\frac{n}{n+1}}$ (c) $\left(\frac{a}{b}\right)^{\frac{n}{n+1}}$ (d) None

Hint: $G_n = a\left(\frac{b}{a}\right)^{\frac{n}{n+1}}$

12) For a geometric series $a_1 + a_2 + a_3 + ... + a_n$ with common ratio r , **2013-93 Eng**

(a) $\frac{r^n - 1}{r - 1}$ (b) $\frac{r - 1}{r^n - 1}$ (c) $\frac{a_1(r^n - 1)}{r - 1}$ (d) $\frac{a_1(r^n + 1)}{r + 1}$

13) Which of the following is true: **2014-96 Eng**

(a) AM > GM > HM (b) AM < GM < HM (c) GM > AM > HM (d) AM > HM > GM

14) G.M of 4 and is: **2014-105 Eng**

(a) 34 (b) 16 (c) 8 (d) 2

Hint: G.M between two positive numbers a and b is: $G.M = \sqrt{ab} = \sqrt{4 \times 64} = \sqrt{256} = \sqrt{16^2} = 16$

15) For a geometric series $a_1 + a_2 + a_3 + ... + a_n$, with common ratio $r \neq 1$, $S_n = ...$ **2015-126 Eng**

(a) $\frac{r^n - 1}{r - 1}$ (b) $\frac{r - 1}{r^n - 1}$ (c) $\frac{a_1(r^n - 1)}{r - 1}$ (d) $\frac{a_2(r^n - 1)}{r - 1}$

16) If A, G, H are Arithmetic, Geometric and Harmonic Means between two positive numbers a, b, then; **2015-147 Eng**

(a) $G > H$ (b) $G^2 = AH$ (c) $A > G$ (d) All of the above

Hint: $A > G > H$ and $G^2 = AH$

Answers:

1. (a) 1
2. (b)
3. (d)
4. (a) 2 5. (a)
6. (b) 32

7. (b) 0 8.(d).Harmonic sequence
9. (a)
10. (a)
11.(d).None

12. (c)
13.(a)AM > GM > HM
14. (b) 16
15. (c)
16. (d) All of the above

CHAP NO 5 MISCELLANEOUS SERIES

1) The kth term of the series $1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \cdots$, is: **2010-32 Eng**

(a) k^2 (b) $\frac{k(k+1)(2k+1)}{6}$ (c) $\frac{k^2(k+1)^2}{4}$ (d) None

Hint: $T_k = 1^2 + 2^2 + 3^2 + \cdots + k^2 = \sum_{n=1}^{k} n^2 = \frac{k(k+1)(2k+1)}{6}$

2) For any natural number n, $1 + 3 + 5 + ... + (2n - 1) = ...$ **2013-12 Eng**

(a) $\frac{n(n+1)}{2}$ (b) $\frac{n^2(n+1)^2}{4}$ (c) $\frac{n(n+1)(n+2)}{2}$ (d) n^2

Hint: $1 + 3 + 5 + \cdots + (2n - 1) = \sum_{k=1}^{n}(2k - 1) = 2\sum_{k=1}^{n} k - \sum_{k=1}^{n} 1 = 2\frac{n(n+1)}{2} - n = n^2$

3) Sum of first 100 natural numbers = **2014-104 Eng**

(a) 50050 (b) 5005 (c) 5151 (d) 5050

Hint: Sum of 1st n natural numbers $= S_n = \frac{n(n+1)}{2} \Rightarrow S_{100} = \frac{100(100+1)}{2} = \frac{100(101)}{2} = 50(101) = 5050$

4) The sigma notation for the series $a_1 + a_2 + a_3 + ... + a_n = ...$ **2015-45 Eng**

(a) $\sum_{k=1}^{n} a_k$ (b) $\sum_{j=1}^{n} a_j$ (c) $\sum_{r=1}^{n} a_r$ (d) All of the above

5) For $n \in$, $\sum_{k=1}^{2n-1} (-1)^k = ...$ **2015-75 Eng**

(a) 1 (b) 0 (c) ∞ (d) -1

Hint: $\sum_{k=1}^{2n-1}(-1)^k = -1+1-1+1-1+.......+(-1)^{2n-1} = -1$. One can understand it batter if give some value to n.

6) N^{th} term of Arithmetical-Geometric series is: **2015-102 Eng**

(a) ar^n (b) $[a+(n-1)d]r^{n-1}$ (c) $(n-1)r^n$ (d) All of the above

7)` $\sum_{j=2}^{10}\frac{1}{j} - \sum_{j=1}^{8}\frac{1}{j+2} =$ _____ **2017**

a)zero b)9/10 c)½ d)1/10

8) the geometrical statement 's concides with b or lies left of b' is expressed as; **2018**

a)a<b b)a>b c)a ≤b d)a≥b

9. the series 1 , + 3 + 5 +…………9 , can be expressed as: **2018**

a)$\sum_{k=1}^{99}(2k-1)^2$ b)$\sum_{k=1}^{99}(2k+1)^2$ c)$\sum_{k=1}^{50}(2k-1)^2$ d)$\sum_{k=1}^{50}(2k+1)^2$

10. the sum of infinite geometric series is : 2018

a)$\frac{a}{1-r}+\frac{dr}{1-r}$ b)$\frac{a}{1-r}-\frac{dr}{(1-r)^2}$ c)$\frac{a}{1-r}+\frac{dr}{(1-r)^2}$ d) $\frac{a}{1-r}$ if |r| <1

Answers:

1. (b)
2. (d)
3. (d) 5050
4.(d) All of the above
5. (d)
6. (b)
7 . (c)
8.(a)
9.(C)
10(C)

CHAP NO 6 PERMUTATION, COMBINATION & PROBABILITY

1) By definition $\frac{P(A\cap B)}{P(B)}$ defines: **2010-7 Eng**

(a) $P(A/B)$ (b) $P(B/A)$ (c) $P(A\cap B)$ (d) $P(A\cup B)$

Hint: $P(A/B)=\frac{P(A\cap B)}{P(B)}$

2) When ${}^nP_2=30$, then $n=$ **2010-60 Eng**

(a) 5 (b) 3 (c) 6 (d) 0

Hint: ${}^nP_2=30 \Rightarrow \frac{n!}{(n-2)!}=30 \Rightarrow n(n-1)=6\times5 \Rightarrow n=6$

3) ${}^nC_r+{}^nC_{r-1}=$………. **2010-151 Eng**

(a) ${}^nC_r$ (b) ${}^nP_r$ (c) ${}^{n+1}C_{r+1}$ (d) ${}^{n+1}C_r$

Hint: ${}^nC_r+{}^nC_{r-1}={}^nC_{r-1}+{}^nC_r={}^{n+1}C_r$

4) If A and B are any two complementary events in a sample space S,then $P(A)+P(B)-P(A\cap B)=$……. **2010-179 Eng**

(a) 1 ` (b) 0 (c) $P(A\cap B)$ (d) $P(A\cup B)$

Hint: Since A and B are complementary events relative to the sample space S, so $P(A)+P(B)=P(S)=1$ and $P(A\cap B)=0$. Hence $P(A)+P(B)-P(A\cap B)=1-0=1$

5) ${}^nC_r=?$ **2011-57 Eng**

(a) $\frac{n!}{(n-r)!.r!}$ (b) $\frac{n!}{(n-r)!}$ (c) $\frac{n!}{r!}$ (d) $\frac{(n-1)!+1}{n!}$

6) If A and B are not mutually exclusive events then $P(A\cup B)=$ **2011-77 Eng**

(a) $P(A)+P(B)$ (b) $P(A)+P(B)-P(A\cap B)$ (c) $P(A)+P(B)+P(A\cap B)$ (d) $P(A)-P(B)$

---

7) If a 4-digited number is formed by using the digit. 1, 2, 3, and 5 with no repetition then the probability that the number is divided by 5 is: **2011-187 Eng**

(a) $\frac{1}{2}$ (b) $\frac{1}{1}$ (c) $\frac{2}{3}$ (d) $\frac{1}{4}$

Hint: Total number of 4-digits numbers formed using the digits 1, 2, 3, 5 is $4!=24$
We know that a number is divisible by 5 if the digit at its unit place is either 0 or 5, so when 5 is fixed at the unitplace, then the total number of 4-digit numbers formed is $3!=6$, hence the required probability is $\frac{6}{24}=\frac{1}{4}$

---

8) The probability of either less than 1 or greater than 6 in rolling die is :_____ **2012-5 Eng**

(a) zero (b) 1 (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

Hint: It is an impossible event so its probability is zero

---

9) If A and B are mutually exclusive events then: **2012-87 Eng**

(a) $P(A\cup B) = P(A) + P(B) - P(A\cap B)$ (b) $P(A\cup B) = P(A) + P(B)$
(c) $P(A\cup B) = P(A) \cup P(B)$ (d) $P(A\cup B) = P(A) \cap P(B)$

---

10) A coin is flipped thrice. The number of sample points in the sample space is: **2012-182 Eng**

(a) 3 (b) 6 (c) 8 (d) 9

Hint: As a coin has two faces, so when it is flipped thrice, then the number of sample points in the simple space is $2^3=8$
The sample space is: $S=\{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}$

---

11) If A and B are any two events defined in a sample space, then P(A – B) =……. **2013-39 Eng**

(a) $P(A) - P(A\cup B)$ (b) $P(A\cup B) - P(A)$ (c) $P(A) - P(A\cap B)$ (d) $P(A\cap B)$

Hint: As, $A-B=A-(A\cap B)$, so $P(A-B)=P(A)-P(A\cap B)$

---

12) ${}^nP_r =$ .... **2013-43 Eng**

(a) $\frac{n(n-1)!}{n-r}$ (b) $\frac{n(n-1)!}{n+r}$ (c) $\frac{n!}{(n-r)!}$ (d) $\frac{n(n-r)!}{n-r}$

---

13) If ${}^nC_6={}^nC_{12}$, then $n=$ .... **2013-73 Eng**

(a) 6 (b) 18 (c) 12 (d) 4

Hint: ${}^nC_6={}^nC_{12}={}^nC_{n-6}\Rightarrow n-6=12\Rightarrow n=18$ $\left(\because {}^nC_r={}^nC_{n-r}\right)$

---

14) If A and B are two mutually exclusive events, then $P(A\cup B)=$ .... **2014-95 Eng**

(a) $P(A)\cup P(B)$ (b) $P(B)\cup A$ (c) $P(A) + P(B)$ (d) $P(A\cap B)$

Hints: As A and B are mutually exclusive, so $P(A\cap B)=0$, so $P(A\cup B)=P(A)+P(B)-P(A\cap B)=P(A)+P(B)$

15) If ${}^nC_6={}^nC_{12}$, then $n=$ .... **2014-134 Eng**

(a) 18 (b) 12 (c) 0 (d) 4

Hint: ${}^nC_6={}^nC_{12}={}^nC_{n-6}\Rightarrow n-6=12\Rightarrow n=18$ $\left(\because {}^nC_r={}^nC_{n-r}\right)$

---

16) If A and B are any two events defined in a sample space, then $P(A-B)=$ .... **2015-125 Eng**

(a) $P(A)-P(A\cap B)$ (b) $P(A)-P(A\cup B)$ (c) $P(A\cap B)-P(A)$ (d) $P(A\cap B)$

Hint: As, $A-B=A-(A\cap B)$, so $P(A-B)=P(A)-P(A\cap B)$

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17) The 3rd term of expresseion n^2 -2/n is : **2017**

a)7/3 b)-7/3 c)3 d)1

18) $\frac{k!}{(k+1)!}$ = _______ **2017**

a)(k+1) b)k c)1/ d)1/(k+1)

19. if a and b are disjoint events, then $P(A \cup B) =$ ______ **2017**

A) P(A)+P(B) B)P(A)+P(B) - P(A∩B)

C)P(A)∪P(B) D)$N\ \frac{(A \cup B)}{n(S)}$

20. In frictional term , n(n-1)(n-2) can be written as: **2018**

a)n! b)$\frac{n!}{(n-3)!}$ c)$\frac{(n-1)!}{(n-2)!}$ d)(n-2!)

21. the correct option for 5! C_5^{10} is : **2018**

i)C_5^{10} ii)P_5^{10} iii)C_5^{11}

a)I only b)ii only c)I and ii d)ii and ii only

22. a student estimate that possibility of passing ETEA is 8/9, what is the possibility of passing the test:

a)7/9 b)2/9 c)1/9 d)3/9

Answers:

1.(a)
2. (c) 6 3.(d)
4. (a) 1
5. (a)
6.Ans: (b)
7. (d)
8.(a)zero
9.Ans:(a)
10. (c) 8
11. (c) P(A) – P(A □ B)
12. (c)
13. (b) 18
14. (c) P(A) + P(B)
15. (a) 18
16. (a)
17.a
18.d
19.a
20.b
21.b
22.c

CHAP NO 7 MATHEMATICAL INDUCTION & BINOMIAL THEOREM

1) If the sum of the coefficients in the expansion of $(1+x)^n$ is 2^n, then the sum of the coefficients in the expansions of $(1+x)^m$ is: **2010-128 Eng**

(a) 2^m (b) $m+1$ (c) 2^{m+n} (d) 2^{n-1}

2) In the expansion $(1+x)^n$, if n is rational, then the number of terms are--------- provided $|x|<1$: **2010-139 Eng**

(a) $n+1$ (b) $n-1$ (c) finite (d) infinite

Hint: If n is a frection or a negative integer and $|x|<1$, then $(1+x)^n = 1 + nx + \frac{n(n-1)}{2!}x^2 + \cdots\cdots\infty$

3) The sum of exponents of a and b in every term of the expansion $(a + b)^n$ is: **2011-91 Eng**

(a) n (b) 1 (c) 0 (d) 2n

4) Second term in the expansion of $(1-2x)^{\frac{1}{3}}$, is : **2011-94 Eng**

(a) $\frac{7}{2}$ (b) $\frac{x}{2}$ (c) $\frac{2x}{3}$ (d) $-\frac{2x}{3}$

Hint: $(1-2x)^{\frac{1}{3}} = 1 + \frac{1}{3}(-2x) + \cdots\cdots = 1 - \frac{2x}{3} + \cdots\cdots$

5) Expansion of $(8-2x)^{-1}$ is valid only if………. **2011-97 Eng**

(a) $|x|>4$ (b) $|x|<4$ (c) $|x|=0$ (d) $|x|=4$

Hint: Since $(8-2x)^{-1} = 8^{-1}\left(1+\left(-\frac{x}{4}\right)\right)^{-1}$, so its expansion is valid only if, $\left|-\frac{x}{4}\right| < 1 \Rightarrow |x| < 4$

6) If n is a negative integer or a fraction, then the binomial expansion $(a + b)^n$ terminates: **2011-164 Eng**

(a) after n terms (b) after $(n+1)$ terms (c) after $(n+2)$ terms (d) Never

7) In binomial expansion $(a+b)^n$ Pascal's triangle is used to find: **2011-171 Eng**

(a) n (b) a , b (c) Binomial coefficients (d) None

8) The general term T_{r+1} in $(a + b)^n$ is: **2011-130 Eng**

(a) $\binom{n}{r}a^{n-r-1}.b^r$ (b) $\binom{n}{r}a^{n-r}$ (c) $\binom{n}{r}a^{n-r}.b^r$ (d) $\binom{n}{r}a^{n-r+1}.b^r$

9) If n is even, then the middle term in the expansion $(a+b)^n$ is: **2014-154 Eng**

(a) $\left(\frac{n+1}{2}\right)$th (b) $\left(\frac{n+2}{2}\right)$th (c) $\left(\frac{n}{2}+1\right)$th (d) Both (b) and (c)

10) If n is even in $(a+b)^n$, then the number of middle term is: **2015-3 Eng**

(a) One (b) Two (c) No middle term (d) Three

Hint: If n is even then $(n+1)$ is odd, so there will be just one middle term in the expansion of $(a+b)^n$, and $\left(\frac{n}{2}+1\right)$th term is the middle term in this case.

11) If 1, 3, 3, 1 are the binomial coefficients in the expansion of $(a+b)^n$, then the index n in the expansion is: **2015-46 Eng**

(a) 4 (b) 2 (c) 3 (d) 8

Hint: As number of terms in the expansion of $(a+b)^n$ are $(n+1)$, so for 4 terms $n=3$

12) In the expansion $(a+b)^n$, ${}^nC_0 =$ .... **2015-148 Eng**

(a) ${}^nC_1$ (b) ${}^nC_2$ (c) ${}^nC_{n-1}$ (d) ${}^nC_n$

Hint: As ${}^nC_r = {}^nC_{n-r} \Rightarrow {}^nC_0 = {}^nC_{n-0} \Rightarrow {}^nC_0 = {}^nC_n$

13. $\frac{1}{6!} + \frac{2}{7!} + \frac{3}{8!} =$ **2017**

a)6/8 b)6!/8! c)75/8! d)6/21

14. the expression $(9 + 2/x)^{-½}$ is valid only when _________? **2018**

a)|x|>9/2 b)|x| <2/9 c)>9/2 d)>2/9

15. the co-efficient of middle term of $(\frac{x}{9} + \frac{9}{x})^2$ is : **2018**

a) $\binom{2}{0}$ b) $\binom{2}{1}$ c) $\binom{2}{2}$ d)none of the above

16. if sum of even co-efficient in the expansion of $(1+x)^n$ is 256, the value of n is: **2018**

a)7 b)8 c)9 d)10

hint: $2^{n-1} = 256 \rightarrow 2^{n-1} = 2^8 \rightarrow n-1 = 8 \rightarrow n = 9$

Answers:

1.(a)
2. (d) infinite
3. (a) n 4. (d)
5. (b)
6. (d) Never
7. (c) Binomial coefficients
8.(c).
9. (d) Both (b) and (c)
10. (a) One
11. (c) 3
12. (d)
13 . c
14
15. b
16 . C

CHAP NO 8 FUNCTIONS & GRAPHS

1) If $X=\{a, b, c, d\}$, $Y=\{1, 2, 3, 4\}$. Then which of the following is a bijective function from X to Y? **2012-13 Eng**

(a) $\{(a, 1), (b, 4), (c, 2), (d, 1)\}$ (b) $\{(c, 1), (d, 4), (b, 1), (a, 3)\}$

(c) $\{(d, 3), (b, 4), (a, 2), (c, 1)\}$ (d) $\{(b, 2), (c, 2), (a, 3), (d, 4)\}$

Hint: A function f from X to Y is bijective if the 2^{nd} elements of any two ordered pairs in f are not the same and range of f=Y

2) If $f(x)=x^2+x-1$, then the images of 2, 3, 5 are: **2013-133 Eng**

(a) 7, 13, 31 (b) 5, 12, 26 (c) 5, 11, 29 (d) 3, 8, 24

Hint: $f(2)=2^2+2-1=5,$ $f(3)=3^2+3-1=11,$ $f(5)=5^2+5-1=29$

3) The set of all first elements of the ordered pairs in a relation R is called: **2013-159 Eng**

(a) Domain of R (b) Range of R (c) Co-domain of R (d) Subset of R

4) If $f(x)=\dfrac{2x}{2x+1}$, then $[f(2)]^{-1}=......$ **2014-26 Eng**

(a) $\frac{4}{7}$ (b) $\frac{5}{4}$ (c) $\frac{-7}{4}$ (d) $\frac{-4}{7}$

Hint: $[f(2)]^{-1}=\left[\dfrac{2(2)}{2(2)+1}\right]^{-1}=\left[\dfrac{4}{5}\right]^{-1}=\dfrac{5}{4}$

5) If set A has 3 and set B has 2 elements then how many ordered pairs are there in B × A? **2014-65 Eng**

(a) 9 (b) 6 (c) 5 (d) 34

Hint: No. of ordered pairs in $B\times A$ = (No. of elements in A) × (No. of elements in B) $=2\times3=6$

6) If A = {c ,d} and B = {e ,f} then {(c,f), (d,e), (c,e), (d,f)} is…….. **2014-66 Eng**

(a) Not a function (b) an onto function from A into B

(c) An onto function from B into A (d) On to and one-one function.

Hint: The 1^{st} elements of (c, f) and (c, e) are the same. So the given set of ordered pairs is not a function.

7) What is the inverse of $f(x)=4+\sqrt{2x}$? **2015-78 Eng**

(a) $\frac{1}{2}(x-4)^2$ (b) $2-x^2$ (c) $4-x^2$ (d) $(4-x)^2$

Hint: Let, $4+\sqrt{2x}=y \Rightarrow x=\frac{1}{2}(y-4)^2 \Rightarrow f^{-1}(y)=\frac{1}{2}(y-4)^2 \Rightarrow f^{-1}(x)=\frac{1}{2}(x-4)^2$

$(\because f(x)=y \Leftrightarrow x=f^{-1}(y))$

8) fo r continuous function f(x) on [a,b] the appropritate root lies in interval [c,b] if:

a) f(x) has opposite signs at x=a and x=b

b) f(x) has opposite signs at x=a and x=c

c) f(x) has same signs at x=a and x=b

d) f(x) has opposite signs at x=c and x=b

9)let f(x) = $\frac{2x-1}{x-1}$ then fomain of $f^{1}x$ is :

a)R – {1} b)R – {2} c)R – {-1} d)R – {-2}

10)the range of the function , f(x) = $\begin{cases} (3x+4), for\ 3x+4>0 \\ -(3x+4), for\ 3x+4<0 \end{cases}$ is: **2018**

a) (∞,0) b)(0,∞) c)(0,-∞) d)(∞,0)

Answers:

1.(c) $\{(d, 3), (b, 4), (a, 2), (c,1)\}$	2. (c) 5, 11, 29	3. (a) Domain of R	4. (b) $\frac{5}{4}$
5. (b) 6	6. (a) Not a function	7. (a) $\frac{1}{2}(x-4)^2$	8. d
9.b	10. b		

CHAPTER NO 9
LINEAR PROGRAMMING

1) The variables involve in a linear problem are called ______ constraints: **2010-11 Eng**
(a) Non negative (b) Positive (c) Problem (d) Both (a) and (c)

2) The solution of $ax + 3y \le c$ is: **2011-74 Eng**
(a) closed half plane (b) open half plane (c) circle (d) parabola

3) Which of the following is not a solution of the equation $2x + 3y = 24$? **2011-191 Eng**
(a) $(9, -2)$ (b) $(0, 8)$ (c) $(12, 0)$ (d) $(6, 4)$

Hint: As $2(9)+3(-2)=18-6=12\neq 24 \Rightarrow (9,-2)$ is not a solution of $2x+3y=24$

4) the objective function is a linear programming is usually denoted by: 2017
a) f(x,x) =ax b)f(x,x) = ax+by a,b ∈ R
c) f(x,y) = (ax)(by) d) $f(x,y) = ax+by+c^2$

5) non-negative constrainsts in a linear problem is given by: 2017
a) x>0, y<0 b) x≥ 0,y≥ 0 c) x=0,y=0 d)x ≤0, y≥ 0
a) (5,-2) b) (5,2) c) (-2,5) d)(-2,5)

6) x=0, is the solution of inequality; 2018
a) x > 0 b)3x+4 < 0 c)2x+3 < 0 d)x-2 <0

Answers:

1. (d) Both (a) and (c)
2. (a) closed half plane
3. a
4. B
5. D
6. A
7. D

CHAP NO 10 TRIGONOMETRIC IDENTITIES OF SUM AND DIFFERENCE OF ANGLES

1) The triangular ratios of $405\frac{\pi}{2}$ are the same as that of: **2010-23 Eng**
(a) $\frac{3\pi}{2}$ (b) $\frac{3\pi}{4}$ (c) $\frac{5\pi}{4}$ (d) $\frac{\pi}{2}$

Hint: As $405\frac{\pi}{2}=\frac{\pi}{2}+202\pi=\frac{\pi}{2}+101(2\pi)$, so the trigonometric ratios of $405\frac{\pi}{2}$ are the same as that of $\frac{\pi}{2}$

2) The terminal ray of $\left(-\frac{2\pi}{3}\right)$ lies in …….. **2010-90 Eng**
(a) 1st quadrant (b) 2nd quadrant (c) 3rd quadrant (d) 4th quadrant

Hint: $-\frac{2\pi}{3}\text{rad}=-\left(\frac{2\times180}{3}\right)^\circ=-(2\times60)^\circ=-120^\circ$ and so the terminal ray of $\left(-\frac{2\pi}{3}\right)$ lies in the 3rd quadrant.

3) $\text{Sin}30^\circ.\text{Cos}60^\circ+\text{Cos}30^\circ.\text{Sin}60^\circ =$ …….. **2010-121 Eng**
(a) 0 (b) $\frac{1}{2}$ (c) 1 (d) ∞

Hint: $\text{Sin}30^\circ.\text{Cos}60^\circ+\text{Cos}30^\circ.\text{Sin}60^\circ=\text{Sin}(30^\circ+60^\circ)=\text{Sin}90^\circ=1$

4) $\text{Sin}(\alpha+\beta)-\text{Sin}(\alpha-\beta)=$ ……. **2010-160 Eng**
(a) **$2\text{Cos}\alpha\text{Sin}\beta$** (b) $2\text{Sin}\beta.\text{Cos}\alpha$ (c) $2\text{Sin}\alpha.\text{Sin}\beta$ (d) $-2\text{Sin}\alpha.\text{Sin}\beta$

Hint: $\text{Sin}(\alpha+\beta)-\text{Sin}(\alpha-\beta)=\text{Sin}\alpha.\text{Cos}\beta+\text{Cos}\alpha.\text{Sin}\beta-(\text{Sin}\alpha.\text{Cos}\beta-\text{Cos}\alpha.\text{Sin}\beta)=2\text{Cos}\alpha.\text{Sin}\beta$

5) $\text{Sin}^2x+\text{Cos}^2x=1$, is true for: **2010-182 Eng**
(a) One value of x (b) Some values of x (c) No value of x (d) All values of x

Hint: $\text{Sin}^2x+\text{Cos}^2x=1$, is an identity, i.e. it is true for all real values of x

6) If $\text{Cot}\,\theta>0$ and $\sin\theta<0$, then terminal ray of the angle lies in quadrant: **2011-104 Eng**

(a) I (b) II (c) III (d) IV

Hint: As $\cot\theta>0$ in I and III quadrants while $\sin\theta<0$ in III and IV quadrants so if $\text{Cot}\,\theta>0$ and $\sin\theta<0$, then the terminal ray of the angle lies in III quadrant

7) $\sin 3\alpha=$ .... **2011-111 Eng**

(a) $4\cos^3\alpha-3\cos\alpha$ (b) $3\cos^3\alpha-4\cos\alpha$ (c) $\mathbf{3\sin\alpha-4\sin^3\alpha}$ (d) $4\sin\alpha-3\sin^3\alpha$

Hint: $\sin 3\alpha=\sin(\alpha+2\alpha)=\sin\alpha.\cos 2\alpha+\cos\alpha.\sin 2\alpha=\sin\alpha(1-2\sin^2\alpha)+\cos\alpha(2\sin\alpha.\cos\alpha)$

$=\sin\alpha-2\sin^3\alpha+2\sin\alpha.\cos^2\alpha=\sin\alpha-2\sin^3\alpha+2\sin\alpha(1-\sin^2\alpha)=3\sin\alpha-4\sin^3\alpha$

8) $\sin\left(\frac{3\pi}{2}-\theta\right)=$ .... **2011-114 Eng**

(a) $\sin\theta$ (b) $\cos\theta$ (c) $-\sin\theta$ (d) $\mathbf{-\cos\theta}$

Hint: $\sin\left(\frac{3\pi}{2}-\theta\right)=\sin\frac{3\pi}{2}.\cos\theta-\cos\frac{3\pi}{2}.\sin\theta=-\cos\theta$

9) The length of ℓ of an arc of a circle in terms of r and θ is: **2011-174 Eng**

(a) $\frac{r}{\theta}$ (b) $\mathbf{r\theta}$ (c) $\frac{\theta}{r}$ (d) None of these

Hint: $\ell=r\theta$, where ℓ is length of the arc of a circle of radius r and θ is the central angle (in radians) subtended by the arc.

10) The associated angle of $\frac{8\pi}{3}$ is: **2012-178 Eng**

(a) $\mathbf{\frac{\pi}{3}}$ (b) $\frac{\pi}{4}$ (c) $\frac{2\pi}{3}$ (d) $\frac{4\pi}{3}$

Hint: As $\frac{8\pi}{3}-2\pi=\frac{2\pi}{3}$, so Associated angle of $\frac{8\pi}{3}$ = associated angle of $\frac{2\pi}{3}=\pi-\frac{2\pi}{3}=\frac{\pi}{3}$

11) $\frac{\cos 75^\circ+\cos 15^\circ}{\sin 75^\circ-\sin 15^\circ}=$ .... **2012-186 Eng**

(a) $\mathbf{\sqrt{3}}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2}$ (d) $\frac{1}{\sqrt{2}}$

Hint: $\frac{\cos 75^\circ+\cos 15^\circ}{\sin 75^\circ-\sin 15^\circ}=\frac{2\cos\left(\frac{75^\circ+15^\circ}{2}\right)\cos\left(\frac{75^\circ-15^\circ}{2}\right)}{2\cos\left(\frac{75^\circ+15^\circ}{2}\right)\sin\left(\frac{75^\circ-15^\circ}{2}\right)}=\frac{\cos 30^\circ}{\sin 30^\circ}=\frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}}=\sqrt{3}$

12) $\text{Sin}\,20^\circ\cos 70^\circ+\cos 20^\circ\sin 70^\circ=$............ **2013-9 Eng**

(a) 1 (b) -1 (c) $\frac{-1}{\sqrt{3}}$ (d) $\frac{2}{\sqrt{3}}$

Hint: $\sin 20^\circ\cos 70^\circ+\cos 20^\circ\sin 70^\circ=\sin(20^\circ+70^\circ)=\sin 90^\circ=1$

13) $\text{Tan}\frac{\theta}{2}=$ .... **2013-2 9 Eng**

(a) $\pm\frac{\sqrt{1+\cos\theta}}{1-\cos\theta}$ (b) $\mathbf{\pm\frac{\sqrt{1-\cos\theta}}{\sqrt{1+\cos\theta}}}$ (c) $\frac{1-\cos\theta}{1+\cos\theta}$ (d) $\frac{1+\cos\theta}{1-\cos\theta}$

Hint: $\text{Tan}\frac{\theta}{2}=\frac{\sin\theta/2}{\cos\theta/2}=\frac{\pm\sqrt{\frac{1-\cos\theta}{2}}}{\pm\sqrt{\frac{1+\cos\theta}{2}}}=\pm\frac{\sqrt{1-\cos\theta}}{\sqrt{1+\cos\theta}}$

14) $(\sec\theta-1)(\sec\theta+1)=$.......... **2013-79 Eng**

(a) $\cot^2\theta$ (b) $\sec^2\theta$ (c) $\tan^2\theta$ (d) $\operatorname{cosec}^2\theta$

Hint: $(\sec\theta-1)(\sec\theta+1)=\sec^2\theta-1=\tan^2\theta$

15) $\sin\left(\alpha+\frac{\pi}{2}\right)=$........... **2013-89 Eng**

(a) $\text{Sin}\alpha$ (b) $-\sin\alpha$ (c) $\cos\alpha$ (d) $-\cos\alpha$

Hint: $\sin\left(\alpha+\frac{\pi}{2}\right)=\sin\alpha.\cos\frac{\pi}{2}+\cos\alpha.\sin\frac{\pi}{2}=\sin\alpha(0)+\cos\alpha(1)=\cos\alpha$

16) π radians $=$........... **2013-106 Eng**

(a) 60° (b) 90° (c) 360° (d) 180°

17) $\sin 40^\circ\cos 50^\circ+\cos 40^\circ\sin 50^\circ=$......... **2014-14 Eng**

(a) 1 (b) -1 (c) 0 (d) ∞

Hint: $\sin 40^\circ\cos 50^\circ+\cos 40^\circ\sin 50^\circ=\sin(40^\circ+50^\circ)=\sin 90^\circ=1$

18) $\text{Tan}2\theta=$.......... **2014-45 Eng**

(a) $\frac{2\text{Tan}\theta}{1-\text{Tan}^2\theta}$ (b) $\frac{1-\text{Tan}^2\theta}{2\text{Tan}\theta}$ (c) $\frac{2\text{Tan}\theta}{1+\text{Tan}^2\theta}$ (d) $\frac{1+\text{Tan}^2\theta}{2\text{Tan}\theta}$

Hint: $\tan(\theta+\phi)=\frac{\tan\theta+\tan\phi}{1-\tan\theta\tan\phi}\Rightarrow\tan(\theta+\theta)=\frac{\tan\theta+\tan\theta}{1-\tan\theta\tan\theta}\Rightarrow\tan 2\theta=\frac{2\tan\theta}{1-\tan^2\theta}$

19) $\frac{\cos^3\alpha-\sin^3\alpha}{\cos\alpha-\sin\alpha}=$.......... **2015-79 Eng**

(a) $1+2\sin\alpha.\cos\alpha$ (b) $1-2\sin\alpha.\cos\alpha$ (c) $1+\sin\alpha.\cos\alpha$ (d) $1-\sin\alpha.\cos\alpha$

Hint: $\frac{\cos^3\alpha-\sin^3\alpha}{\cos\alpha-\sin\alpha}=\frac{(\cos\alpha-\sin\alpha)(\cos^2\alpha+\sin^2\alpha-2\sin\alpha.\cos\alpha)}{(\cos\alpha-\sin\alpha)}=1-2\sin\alpha.\cos\alpha$

20) $\text{Sin}(2\pi-\beta)=$......... **2015-112 Eng**

(a) $\text{Sin}\beta$ (b) $\sin 2\pi$ (c) $\text{Cos}\beta$ (d) $\text{Sin}2\pi$

21) If measue of the centre angle of a minor arc is θ,the measureof the angle subtended by the correspondent major arc:

a) 2θ b) θ c) θ^2 d) $\theta^2/2$

22) If θ/2 lies in the 3rd or 4rth quadrant , then sin ρ/2 =_________ **2017**

a) $\sqrt{\frac{1+\cos\theta}{2}}$ b) $\sqrt{\frac{1-\cos\theta}{2}}$ c) $-\sqrt{\frac{1+\cos\theta}{2}}$ d) $\pm\sqrt{\frac{1+\cos\theta}{2}}$

23) If θ < π, then the relation between θ/2 and π/2 is given by: 2017

a) $\frac{\theta}{2}=\frac{\pi}{2}$ b) $\frac{\theta}{2}<\frac{\pi}{2}$ c) $\frac{\theta}{2}>\frac{\pi}{2}$ d) $\frac{\theta}{2}\geq\frac{\pi}{2}$

24) $\frac{\cos 5\theta+\cos 3\theta}{\sin 5\theta+\sin 3\theta}=$ 2017

a)b)c)d)

25) The correct option for tan3θ is : 2018

a) $\frac{3\tan\theta-\tan^2\theta}{1+3\tan^2\theta}$ b) $\frac{3\tan\theta-\tan^2\theta}{1-3\tan^2\theta}$ c) $\frac{3\tan\theta-\tan^2\theta}{1+3\tan\theta}$ d) $\frac{3\tan\theta\tan^2\theta}{1-3\tan^2\theta}$

26) The identity $\frac{2\tan\theta}{1+\tan^2\theta}$ is true for :

a) cos2θ b) tan2θ c) sin2θ d) cot2θ

Answers:

1. (d)
2. (c) 3rd quadrant
3. (c) 1 4. (a)
5. (d) All values of x
6. (c) III7. (c)
8. (d)
9. (b)
10. (a)
11. (a)

12. (a)	17. (a)	22.c
13. (b)	18. (a)	23.b
14. (c)	19. (c)	24.c
15. (c) cos	20. (a)	25.a
16. (d) 180o	21.d	26.c

CHAP NO 11 APPLICATION OF TRIGONOMETRY

1. The point of intersection of the medians of a triangle is called: **2011-64 Eng**
   (a) in-center (b) centroid (c) orthocenter (d) circumcenter

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2. With usual notation, the value of a – b + c is: **2011-121 Eng**
   (a) s + b (b) s – b (c) 2 s – b (d) $\mathbf{2(s-b)}$

Hint: $a-b+c=a+b+c-2b=2s-2b=2(s-b)$ $(\because 2s=a+b+c)$

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3. Radius of the described circle opposite to the vertex A is: **2011-124 Eng**
   (a) $\frac{\Delta}{a}$ (b) $\frac{\Delta}{s}$ (c) $\mathbf{\frac{\Delta}{s-a}}$ (d) $\frac{s-a}{\Delta}$

---

4. The radius R of the circum-circle is: **2011-183 Eng**
   (a) $\frac{a}{2\sin\alpha}$ (b) $\frac{b}{2\sin\beta}$ (c) $\frac{abc}{4\Delta}$ (d) All

Hint: $R=\frac{a}{2\sin\alpha}=\frac{b}{2\sin\beta}=\frac{c}{2\sin\gamma}=\frac{abc}{4\Delta}$

---

5. If a, b, c are sides of a triangle and $s=\frac{a+b+c}{2}$, then area of the triangle is: **2013-19 Eng**
   (a) $\sqrt{2s(s-a)(s-b)(s-c)}$ (b) $\sqrt{s(s+a)(s+b)(s+c)}$
   (d) $\sqrt{2s(s+a)(s+b)(s+c)}$ (d) $\mathbf{\sqrt{s(s-a)(s-b)(s-c)}}$

---

6. A circle passing through the vertices of any triangle is called: **2013-49 Eng**
   (a) Semi circle (b) Circum-circle (c) In-circle (d) Escribed circle

---

7. If a, b, c are the sides of a triangle and a, β, γ are the respective angles, then area of the triangle is: **2013-103 Eng**
   (a) $\frac{1}{2}a^2\text{Sin}\alpha$ (b) $\frac{1}{2}b^2\text{Sin}\gamma$ (c) $\frac{1}{2}\text{Sin}\alpha$ (d) $\mathbf{\frac{1}{2}bc\text{Sin}\alpha}$

---

8. $(\text{cosec}\theta-1)(\text{cosec}\theta+1)=$.......... **2014-5 Eng**
   (a) $\tan^2\theta$ (b) $\mathbf{\cot^2\theta}$ (c) $\sec^2\theta$ (d) $\sin^2\theta$

Hint: $(\text{cosec}\theta-1)(\text{cosec}\theta+1)=\text{cosec}^2\theta-1=Cot^2\theta$

---

9. $15^\circ=$......... **2014-35 Eng**
   (a) $\frac{\pi}{6}$ radians (b) $\mathbf{\frac{\pi}{12}}$ **radians** (c) $\frac{\pi}{18}$ radians (d) $\frac{\pi}{24}$ radians

Hint: $15^\circ=15\times\frac{\pi}{180}\text{rad}=\frac{\pi}{12}\text{rad}$

---

10. If a, b, c are the lengths of the sides of a triangle and $\alpha,\ \beta,\ \gamma$ are its included angles then $\frac{b^2+c^2-a^2}{2bc}=$ **2014-106 Eng**
    (a) $\text{Sin}\alpha$ (b) $\mathbf{\text{Cos}\alpha}$ (c) $\text{Cos}\beta$ (d) $\text{Cos}\gamma$

Hint: $\text{Cos}\alpha=\frac{b^2+c^2-a^2}{2bc}$

11. The in-radius of circle inscribed in a triangle with sides a, b, c is: **2015-47 Eng**

(a) $\frac{\Delta}{S-a}$ (b) $\frac{\Delta}{S-b}$ (c) $\frac{\Delta}{S-c}$ (d) $\frac{\Delta}{S}$

12. $a^2 = b^2 + c^2 - 2bc\cos\alpha$, is called: **2015-128 Eng**

(a) Law of sines (b) Law of cosines (c) Law of tangents (d) Law of cotangents

13. If a, b, c are the sides of a triangle and α, β γ are the respectively angles, then area of the triangle is; **2015-183 Eng**

(a) $\frac{1}{2}a^2\sin\alpha$ (b) $\frac{1}{2}b^2\sin\gamma$ (c) $\frac{1}{2}c^2\sin\beta$ (d) $\frac{1}{2}bc\sin\alpha$

Hints: $\Delta = \frac{1}{2}bc\sin\alpha = \frac{1}{2}ac\sin\beta = \frac{1}{2}ab\sin\gamma = \frac{1}{2}a^2\frac{\sin\beta\sin\gamma}{\sin\alpha} = \frac{1}{2}b^2\frac{\sin\alpha\sin\gamma}{\sin\beta} = \frac{1}{2}c^2\frac{\sin\alpha\sin\beta}{\sin\gamma}$

14) $\pm\sqrt{\frac{1-\cos^2 2\alpha}{2}}$ =

a)-sinα b)cosα c)sinα d) -cosα

15) if measure of the central angle of the minor arc isθ, then measure of the angle made bu the major arc is ; 2016

a)½θ b)θ c)3θ d)10

16) in terms of Δ, sin a =_______ , where a,b and c as its sides of triangle; 2016

a)4s/bc b)Δ/bc c)2Δ/bc d)2Δ/a

17) if α,β and γ are angles of the triangles with a,b and c as its sides, then which is the correct statement.

a)$a^2= b^2+c^2+2bc\cos\theta$ b)$a^2=b^2-c^2-2bc\cos\theta$ c)$a^2=b^2+c^2-2bc\cos\theta$ d)$a^2=b^2-c^2+2bc\cos\theta$

18) let an oblique triangle with dimenstions a =30, b=7- and β = 85^0, then for finding α,we use______? **2018**

a)sin aw b)cosine law c)tangent law d)both a and b

Answers:

1.(b).centroid	**7. (d)**	**13. (d)**
2.(d)	**8. (b)**	**14. c**
3. (c)	**9. (b)**	**15.b**
4. (d) All	**10. (b)**	**16.c**
5. (d)	**11. (d)**	**17.c**
6. (b) Circum-circle	**12. (b) Law of cosines**	**18.d**

CHAP NO 12 GRAPHS OF TRIGONOMETRIC AND INVERSE TRIGONOMETRIC FUNCTIONS AND SOLUTIONS OF TRIGONOMETRIC EQUATIONS

1) The period of $3\sin\frac{x}{3}$ is ……… **2011-117 Eng**

(a) π (b) 2π (c) 3π (d) 6π

Hint: Period of $3\sin\frac{x}{3} = \frac{\text{period of }\sin x}{1/3} = \frac{2\pi}{1/3} = 6\pi$

2) The domain of the function $y = \cos^{-1}x$ is: **2011-127 Eng**

(a) $0 \le x \le 1$ (b) $-1 \le x \le 1$ (c) $1 \le x \le 2$ (d) $-2 \le x \le 2$

Hint: $\cos y = x \Leftrightarrow y = \cos^{-1}x, \quad -\frac{\pi}{2} \le y \le \frac{\pi}{2}, \quad -1 \le x \le 1$

3) The domain of principal sine function is: **2011-131 Eng**

(a) $\left[0, \frac{\pi}{2}\right]$ (b) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (c) $\left[0, \frac{3\pi}{2}\right]$ (d) $[0, 2\pi]$

4) $\tan^{-1}\left(\frac{5}{6}\right) + \tan^{-1}\left(\frac{1}{11}\right) =$ ……… **2012-35 Eng**

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{3\pi}{2}$ (d) $\frac{\pi}{3}$

Hint: $\tan^{-1}\left(\frac{5}{6}\right)+\tan^{-1}\left(\frac{1}{11}\right)=\tan^{-1}\left(\frac{5/6+1/11}{1-(5/6)(1/11)}\right)=\tan^{-1}\left(\frac{61/66}{61/66}\right)=\tan^{-1}(1)=\frac{\pi}{4}$

---

5) Period of $\frac{1}{2}\tan 3x$ is ……… **2012-109 Eng**

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$ (c) $\frac{2}{\pi}$ (d) $\frac{\pi}{7}$

Hint: Period of $\frac{1}{3}\tan 3x=\frac{\text{Period of } \tan x}{3}=\frac{\pi}{3}$

---

6) Period of $\sin x$ is………. **2012-119 Eng**

(a) $\frac{\pi}{2}$ (b) 2π (c) π (d) $\frac{3\pi}{2}$

---

7) If A (x_1,y_1), B(x_2,y_2), C(x_3,y_3) are the vertices of a triangle ABC and a, b, c be the lengths of its side then $\left(\frac{ax_1+bx_2+cx_3}{a+b+c},\frac{ay_1+by_2+cy_3}{a+b+c}\right)$ is the: **2012-138 Eng**

(a) Ortho-center (b) Centroid (c) In-centre (d) Circum-centre

Hint: In-centre is the centre of the circle drawn inside a triangle touching all of its three sides internally.

---

8) The domain of principal sine function is: **2013-26 Eng**

(a) $\left[0,\frac{\pi}{2}\right]$ (b) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$ (c) $\left[0,\frac{3\pi}{2}\right]$ (d) $[0,2\pi]$

---

9) The inverse relation of y = sin x, is defined by the equation: **2013-126 Eng**

(a) $y=\sin^{-1}x$ (b) $\mathbf{x=\sin^{-1}y}$ (c) $y=\cos^{-1}x$ (d) $x=\cos^{-1}y$

Hint: $R^{-1}=\{(y,x):(x,y)\in R\}$, where R^{-1} is inverse relation of a relation R

---

10) The period of tan x is: **2014-44 Eng**

(a) 2π (b) -2π (c) π (d) $-\pi$

---

11) The domain of principle Sine function is: **2015-1 Eng**

(a) $\left[0,\ \frac{\pi}{2}\right]$ **(b)** $\left[-\frac{\pi}{2},\ \frac{\pi}{2}\right]$ (c) $\left[0,\ \frac{3\pi}{2}\right]$ (d) $[0,\ 2\pi]$

---

12) the range of $y=\cos^{-1}x$ is: 2016

a) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$ b) $\left[\frac{\pi}{2},\frac{\pi}{2}\right]$ c) $[0,\pi]$ d) $[0,2\pi]$

---

13) if g(x) = 3x+1, then $g^{-1}(g(x))$= 2016

a) zero b)x c)g(x) d)none of the above

---

14) if θ = 0,±π, ±2π,……..±nπ,n ∈ Z, then R-{t|t=nπ, n ∈Z}, is the domain of …….. 2016

a)sine b)cosine c)tangent d)cotangent

---

15) period of the function y=5sin 3x, is 2016

a)5π/2 b)3π/2 c)2π/3 d)2π

---

16) $\tan^{-1}$ (5/6) + Tan^{-1} (1/11)= ?

a)-π/4 b)π/4 c)π/5 d)π/11

---

17) domain and range of the relation $x^2+y^2=9$, is 2016

a) R b){a|a∈R,a>0} c){-3,-3} d){-3,3}

---

18) graph of the function y= sinx over the interval [0,2π] intersects with x-axis at: 2017

a)sin(-θ)= -sinθ b)sin (θ±2π) c)sin(θ-π)=-sinθ d)sin(π-θ) = sinθ

a)one pointas b)two points c)three points d)infinite points

---

19)` which one of the folloqing expresses periodic property

a)sin(-θ)=-siinθ b) sin (θ±2π)= - sinθ c)sin(θ-π) = - sinθ d)sin (π-θ) = sinθ

---

20) the correct option for $\cos^{-1}$ (-x)+ $\cos^{-1}$ (-x)= 2018

a)zero b)π c)$\pi/2$ d)$3\pi/2$

21) the graph o fthe y=secx, does not meet: 2018
a)x-axis b) y-axis c)at $x = 0^0$ d)none of the above

22) the domain of f(x)=secx is; 2018
a)$(0,\pi)-\{\pi/2\}$ b)$[-\pi/2, \pi/2]$ c)$[0,\pi]-\{\pi/2\}$ d)$(-\pi/2, \pi/2)$

Answers:

1. (d) 6π	2. (b) $-1\le x\le 1$	3. (b) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$	4. (b) $\frac{\pi}{4}$	5. (b) $\frac{\pi}{3}$	6. (b) 2π
7. (c) In-centre	8. (b) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$	9. (b) $x=\sin^{-1}y$	10. (c) π	11.(b) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$	12.c
13.b	14.d	15.c	16.b	17.d	18.a
19.b	20.a	21.a	22.c		

CHAP NO 1 FUNCTIONS & LIMITS

1) $\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n =$ **2010-14 Eng**

(a) e (b) $\lim_{n\to 0}(1+n)^{\frac{1}{n}}$ (c) 1 (d) Both (a)&(b)

Hint: $\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n = \lim_{n\to 0}(1+n)^{\frac{1}{n}} = e \approx 2.71828$

2) If $X=\{a, b, c, d\}$, $Y=\{1, 2, 3, 4\}$ and $g=\{(a, 3), (b, 2), (c, 3)\}$, then g is __ function from x to y. **2010-20 Eng**

(a) $1-1$ (b) Onto (c) Bijective (d) None

Hint: As $\text{Dom}(g)=X$, $\text{Rang}(g)=\{2, 3\}\neq Y$ but distinct elements of X have distinct images in Y, so g is a $1-1$ function

3) $\lim_{x\to\infty}\left(\frac{\sqrt{1+x}-1}{x}\right) =$ **2010-28 Eng**

(a) $\frac{0}{0}$ (b) $\frac{1}{2}$ (c) ∞ (d) 0

Hint: $\lim_{x\to\infty}\left(\frac{\sqrt{1+x}-1}{x}\right) = \lim_{x\to\infty}\left(\frac{\sqrt{1+x}-1}{x}\times\frac{\sqrt{1+x}+1}{\sqrt{1+x}+1}\right) = \lim_{x\to\infty}\left(\frac{\cancel{x}}{\cancel{x}\left(\sqrt{1+x}+1\right)}\right) = \lim_{x\to\infty}\frac{1}{\sqrt{1+x}+1} = \frac{1}{\infty} = 0$

4) $y=-2^x$ is the reflection of: **2010-44 Eng**

(a) $y=\frac{1}{2^x}$ (b) $y=2^x$ (c) $y=(-2)^x$ (d) $y=\frac{1}{-2x}$

Hint: $y=f(-x)$ is the reflection of $y=f(x)$ about $y-$axis and $-y=f(x)$ is the reflection of $y=f(x)$ about $x-$axisso $y=-2^x$ is the reflection $y=2^x$ about $x-$axis.

5) $\lim_{x\to\infty}\left(\frac{2x^2+5x+1}{20x^2-1}\right) =$ **2010-54 Eng**

(a) $\frac{1}{10}$ (b) ∞ (c) -1 (d) 0

Hint: $\lim_{x\to\infty}\left(\frac{2x^2+5x+1}{20x^2-1}\right) = \lim_{x\to\infty}\left(\frac{2+5/x+1/x^2}{20-1/x^2}\right) = \frac{1}{10}$

6) The Function $f : x \longrightarrow \sqrt{x}$ is called: **2010-76 Eng**

(a) Identity function (b) linear function (c)Square root function (d) None

---

7) $\lim_{m\to\infty}\left(1+\frac{1}{m}\right)^{20} = \ldots\ldots\ldots$ **2010-97 Eng**

(a) 0 (b) ∞ (c) e (d) 1

Hint: $\lim_{m\to\infty}\left(1+\frac{1}{m}\right)^{20} = \left(1+\lim_{m\to\infty}\frac{1}{m}\right)^{20} = (1+0)^{20} = 1^{20} = 1$

---

8) Range of the function $f(x) = x^2 + 1$, is……… **2010-132 Eng**

(a) □ (b) $f(x) > 1$ (c) $\mathbf{f(x) \geq 1}$ (d) ∞

Hint: We know that, $\forall x \in$ □ , $x^2 \geq 0 \Rightarrow x^2 + 1 \geq 1 \Rightarrow f(x) \geq 1$

---

9) If $f(x) = \frac{1}{x}$ and $g(x) = x^3$, then: **2010-175 Eng**

(a) $f\circ g < g\circ f$ (b) $f\circ g \neq g\circ f$ (c) $\mathbf{f\circ g = g\circ f}$ (d) $f\circ g > g\circ f$

Hint: $f\circ g(x) = f(g(x)) = f(x^3) = \frac{1}{x^3}$ and $g\circ f(x) = g(f(x)) = g\left(\frac{1}{x}\right) = \left(\frac{1}{x}\right)^3 = \frac{1}{x^3}$, so $f\circ g = g\circ f$

---

10) The inverse of $y = 2^x$, is: **2010-188 Eng**

(a) $y = \log_2 x$ (b) $y = 2 - x$ (c) $y = -2x$ (None of above d)

Hint: $f(x) = y = 2^x \Rightarrow \ln y = \ln 2^x = x\ln 2 \Rightarrow x = \frac{\ln y}{\ln 2} \Rightarrow f^{-1}(y) = \frac{\ln y}{\ln 2} \Rightarrow f^{-1}(x) = \frac{\ln x}{\ln 2}$ $\left(\because y = f(x) \Rightarrow x = f^{-1}(y)\right)$

---

11) $\lim_{x\to\infty}\frac{\sin x}{x} = \ldots\ldots$ **2011-4 Eng**

(a) 0 (b) 1 (c) 2 (d) 6

---

12) If $\lim_{x\to\infty}\left(1+\frac{1}{n}\right)^{2n} =$ **2011-11 Eng**

(a) e^{-1} (b) $e^{\frac{1}{2}}$ (c) $\mathbf{e^2}$ (d) e^3

Hint: $\text{Lim}_{n\to\infty}\left(1+\frac{1}{n}\right)^{2n} = \left(\text{Lim}_{n\to\infty}\left(1+\frac{1}{n}\right)^{n}\right)^2 = (e)^2 = e^2$

---

13) $\text{Lim}_{x\to\infty}\left(1+\frac{1}{x}\right)^{x} = ______$ **2012-7 Eng**

(a) x (b) $\frac{1}{x}$ (c) e (d) ∞

Hint: $\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^{x} = \lim_{x\to 0}(1+x)^{\frac{1}{x}} = e$

---

14) $\lim_{x\to 0}\frac{x}{\log_a x} = \ldots\ldots\ldots$ **2012-105 Eng**

(a) 0 (b) 2 (c) 3 (d) ∞

Hint: $\lim_{x\to 0}\frac{x}{\log_a x} = \lim_{x\to 0}\frac{\frac{d}{dx}(x)}{\frac{d}{dx}\log_a x} = \lim_{x\to 0}\frac{1}{\frac{1}{x\ln a}} = \lim_{x\to 0} x\ln a = 0.\ln a = 0$

---

15) If $f(x) = \frac{x}{x+1}$ then $[f(2)]^{-1} = \ldots\ldots\ldots\ldots$ **2013-99 Eng**

(a) $\frac{1}{2}$ (b) $\frac{-2}{3}$ (c) $\frac{2}{3}$ (d) $\frac{3}{2}$

Hint: $\left[f(2)\right]^{-1}=\left[\frac{2}{2+1}\right]^{-1}=\left[\frac{2}{3}\right]^{-1}=\frac{3}{2}$

16) Sinhx = ... **2013-136 Eng**

(a) $\frac{1}{2}\left(e^{-x}+e^{-x}\right)$ (b) $\frac{1}{2}\left(e^{x}-e^{-x}\right)$ (c) $\frac{1}{2}\left(e^{-x}-e^{-x}\right)$ (d) $\frac{1}{2}\left(e^{x}+e^{-x}\right)$

17) Let $f(x)=2x-1$ and $g(x)=\sqrt{2x+5}$, then $f\left(g(2)\right)=$ .... **2015-35 Eng**

(a) 5 (b) $\sqrt{11}$ (c) Undefined (d) -5

Hint: $f\left(g(2)\right)=f\left(\sqrt{2(2)+5}\right)=f\left(\sqrt{9}\right)=f(3)=2(3)-1=6-1=5$

18) if y=f(x) is continuous on (a,b) then f(x) has infection point at x = c,iif: 2016

a)f'(c) = 0 b)f'(c) > 0 c)f'(c),0 d) f''(c) = 0

19) the approximate solution of a function y=f(x) lies in the interval (a,b) is: 2011

a)f(a).f(b)>0 b)f(a)<0 c) f(a).f(b)<0 d) f(b)>0

20) if f(x) and g(x) are two function s then $(f*g)^{-1}(x)$ = ? **2016**

a)(g*f)(x) b)$(f^{-1} * g^{-1})(x)$ c)$(g^{-1} * f^{-1})$ d)(g*f)(1/x)

21) $\log_c a.\log_a b$ = ? **2016**

a)$\log_c a$ b) $\log_b c$ c)$\log_c b$ d)1

22) if f(x) = $\begin{cases} 3x+2 & for \leq 1 \\ x^2-1 & for\ x>1 \end{cases}$, then f(1) is **2016**

a)-1 b)0 c)3 d)5

23) $\lim_{(x,y)\to(-1,1)} f(x,y) = \frac{x^2}{x^2+y^2+2}$ is : **[2017]**

a)1/4 b)-1/4 c)½ d)/½

24) degrees of the homogenous function f(x,y) = $\frac{\sqrt{x}+\sqrt{y}}{x+y}$ is; **[2017]**

a)1 b)0 c)½ d)-½

25) if $\begin{cases} +k(x+1), & if\ x \leq 0 \\ k(1-x^2), & is\ x>0 \\ 0, & is\ x=0 \end{cases}$ then If f(2) = 5, k =

a)0 b)5/3 c)-5/3 d)-1/2

26) let f(x) be a differentiable function on (a,b) then f(x) is stricktly decreasing on(a,b) if: **[2017]**

a) f '(x)>0 for a <x<b b) f '(x) < 0 for a <x<b

c) f '(x) = 0 for a <x<b d) f '(x) ≤ 0 for a <x<b

27) which of the following is the correct option for the expression linmx → $8\frac{\sqrt{x}-\sqrt{8}}{x-8}$ = **[2018]**

a)$8\sqrt{2}$ b)$4\sqrt{2}$ c)$2\sqrt{2}$ d)$1/4\sqrt{2}$

28) $\lim_{x\to 0}\frac{(1+x)^{50}-1}{x}$ = **[2018]**

a)50 b)0 c)1 d)n

Answers:

1. (d) Both (a)&(b)
2. (d) None
3. (d) 0 4. (b)
5.(a)
6.(c)Square root function
7. (d) 1
8. (c)
9. (c)
10. (None of above d)
11. (b) 1
12. (c)
13. (c) e
14. (a) 0
15. (d)
16. (b)
17. (a) 5
18.d
19.c
20.c
21.c
22.d
23.a
24.c
25.c
26.b
27.d
28.a

CHAP NO 2 DIFFERENTIATION

1) $\frac{d}{dx}a^x = ...$ **2010-106 Eng**

(a) a^x (b) $a^x.\ln e$ (c) $\frac{ax}{\ln a}$ (d) $a^x.\ln x$

Hint: $\frac{d}{dx}a^x = a^x.\ln a$

---

2) $\frac{d}{dx}(\cos x.\sec x) =$ **2010-110 Eng**

(a) 1 (b) 0 (c) $\sec^2 x$ (d) None of above

Hint: $\frac{d}{dx}(\cos x.\sec x) = \frac{d}{dx}\left(\cos x.\frac{1}{\cos x}\right) = \frac{d}{dx}(1) = 0$

---

3) $\frac{d}{dx}\left(\frac{1}{g(x)}\right) =$ ……., where $g(x) \neq 0$ **2010-146 Eng**

(a) $-g(x)$ (b) $\frac{-g'(x)}{[g(x)]^2}$ (c) 0 (d) None

Hint: $\frac{d}{dx}\left(\frac{1}{g(x)}\right) = \frac{d}{dx}[g(x)]^{-1} = -[g(x)]^{-2} g'(x) = -\frac{g'(x)}{[g(x)]^2}$

---

4) $\frac{d}{dx}\log_e(\text{Sinx}) =$ ……… **2010-156 Eng**

(a) Tan x (b) Cosec x (c) Cos x (d) Cotx

Hint: $\frac{d}{dx}\log_e(\text{Sinx}) = \frac{d}{dx}\ln(\text{Sinx}) = \frac{1}{\text{Sinx}}\frac{d}{dx}(\text{Sinx}) = \frac{\text{Cosx}}{\text{Sinx}} = \text{Cotx}$

---

5) If x be the height of a person and t be the time taken for x then $\frac{dx}{dt}$ is______ **2012-2 Eng**

(a) Velocity (b) acceleration (c) Growth (d) None

---

6) $\frac{d}{dx}\text{sech}x = ...$ **2012-15 Eng**

(a)tan h x sech x (b) – tanh x.sech x (c) coshx (d) – cosh x

---

7) $\frac{d}{dx}\sinh^{-1}x = ...$ **2012-18 Eng**

(a) $\frac{1}{\sqrt{1+x^2}}$, $x \in$ (b) $\frac{1}{\sqrt{x^2-1}}$, $x \in$ (c) $\frac{1}{1-x^2}$ (d) $\frac{1}{1+x^2}$

8) $\frac{d}{dx}(|x|) = ...$ **2012-96 Eng**

(a) $\frac{x}{x^2}$ (b) $\frac{x^x}{x}$ (c) $\frac{x}{|x|}$ (d) $\frac{|x|}{x}$

Hint: $\frac{d}{dx}(|x|) = \frac{d}{dx}\left(\sqrt{x^2}\right) = \frac{d}{dx}\left(x^2\right)^{\frac{1}{2}} = \frac{1}{2}\left(x^2\right)^{\frac{1}{2}-1}\frac{d}{dx}\left(x^2\right) = \frac{1}{2}\left(x^2\right)^{-\frac{1}{2}}(2x) = \frac{x}{\left(x^2\right)^{\frac{1}{2}}} = \frac{x}{\sqrt{x^2}} = \frac{x}{|x|}$

9) $\frac{d}{dx}\text{Coshx} = ...$ **2012-132 Eng**

(a) **Sinhx** (b) Sec h x (c) −Sinhx (d) Tanhx

10) The derivative of $-8x^5$ is: **2013-139 Eng**

(a) −8 (b) −40x (c) $-40x^5$ (d) $-40x^4$

Hint: $\frac{d}{dx}\left(-8x^5\right) = -8\frac{d}{dx}x^5 = -8\left(5x^4\right) = -40x^4$

11) $\frac{d}{dx}\text{cosecx} = ...$ **2013-163 Eng**

(a)Tan x. cosec x (b) –cot x. sec x (c) –tan x. sec x (d) –cot x.cosec x

12) $\frac{d}{dx}\text{cosec}^{-1}x = ?$, where $x \in \mathbb{R} - [-1, 1]$ **2013-166 Eng**

(a) $\frac{1}{x\sqrt{x^2+1}}$ (b) $\frac{1}{x\sqrt{x^2-1}}$ (c) $\frac{-1}{|x|\sqrt{x^2+1}}$ (d) $\frac{-1}{|x|\sqrt{x^2-1}}$

13) $\frac{d}{dx}\text{Cos}^{-1}x = ...$ **2014-156 Eng**

(a) $\frac{1}{\sqrt{1-x^2}}, x \in (-1, 1)$ (b) $\frac{1}{\sqrt{x^2+1}}, x \in \mathbb{R}$ (c) $\frac{-1}{\sqrt{1-x^2}}, x \in (-1, 1)$ (d) $\frac{-1}{\sqrt{x^2+1}}, x \in \mathbb{R}$

Hint: $\frac{d}{dx}\text{Cos}^{-1}x = \frac{-1}{\sqrt{1-x^2}}, \quad x \in (-1, 1)$

14) Derivative of e^{-3x} is………….. **2014-164 Eng**

(a) $-3e^{-3x}$ (b) e^{-3x} (c) $-e^{-3x}$ (d) $3e^{-3x}$

Hint: $\frac{d}{dx}e^{-3x} = e^{-3x}\frac{d}{dx}(-3x) = -3e^{-3x}$

15) If $y = (3x^2 - 6x + 4)^{-1}$, then $\frac{dy}{dx} = ...$ **2014-165 Eng**

(a) $\frac{6(x-1)}{\left(3x^2-6x+4\right)^2}$ (b) $\frac{-6(x+1)}{\left(3x^2-6x+4\right)^2}$ (c) $\frac{-6(x-1)}{\left(3x^2-6x+4\right)^2}$ (d) $\frac{-6(1-x)}{\left(3x^2-6x+4\right)}$

Hint: $\frac{d}{dx}\left(3x^2-6x+4\right)^{-1} = -1\left(3x^2-6x+4\right)^{-1-1}\frac{d}{dx}\left(3x^2-6x+4\right) = -\left(3x^2-6x+4\right)^{-2}(6x-6) = \frac{-6(x-1)}{\left(3x^2-6x+4\right)^2}$

16) If $x = f(t)$ and $y = g(t)$, then $\frac{dy}{dx} = ...$ **2015-13 Eng**

(a) $\frac{dy}{dt}.\frac{dt}{dx}$ (b) $\frac{dy}{dt}.\frac{1}{\frac{dx}{dt}}$ (c) $\frac{\left(\frac{dy}{dt}\right)}{\left(\frac{dx}{dt}\right)}$ (d) All of the above

Hint: By chain rule, $\frac{dy}{dx}=\frac{dy}{dt}.\frac{dt}{dx}=\frac{dy}{dt}.\frac{1}{\frac{dx}{dt}}=\frac{\left(\frac{dy}{dt}\right)}{\left(\frac{dx}{dt}\right)}$

---

17) The ratio of dy to dx for $xy=2$, is **2015-23 Eng**

(a) $\frac{dy}{dx}=y$ (b) $\frac{dy}{dx}=\frac{2}{y}$ (c) $\mathbf{\frac{dy}{dx}=\frac{-y}{x}}$ (d) $\frac{dy}{dx}=\frac{-x}{y}$

Hint: $\frac{d}{dx}(xy)=\frac{d}{dx}(2)\Rightarrow x\frac{dy}{dx}+y\frac{dx}{dx}=0\Rightarrow x\frac{dy}{dx}+y=0\Rightarrow\frac{dy}{dx}=\frac{-y}{x}$

---

18) If n is a positive integer and $f(x)=x^{-n}$, where $x\neq0$, then $f'(x)=$.......... **2015-100 Eng**

(a) nx^{n-1} (b) $-nx^{-n}$ (c) $\mathbf{-nx^{-n-1}}$ (d) nx^{-n-1}

Hint: $f'(x)=\frac{d}{dx}(x^{-n})=-nx^{-n-1}$

---

19) If $x=t^2+3t-2$, $y=2-t-t^2$, then $\frac{dy}{dx}=$.......... **2015-101 Eng**

(a) $\frac{t^2+3t-2}{2-t-t^2}$ (b) $\frac{2t^2+3t-2}{-t-2t^2}$ (c) $\mathbf{\frac{-(2t+1)}{2t+3}}$ (d) $\frac{2t+3}{-2t-1}$

Hint: Since, $\frac{dx}{dt}=\frac{d}{dt}(t^2+3t-2)=2t+3$, $\frac{dy}{dt}=\frac{d}{dt}(2-t-t^2)=-1-2t=-(2t+1)$, so $\frac{dy}{dx}=\frac{dy}{dt}\div\frac{dx}{dt}=\frac{-(2t+1)}{2t+3}$

---

20) $\frac{d}{dx}\text{Cos}^{-1}x=$........... **2015-141 Eng**

(a) $\frac{1}{\sqrt{1+x^2}}$ (b) $\frac{-1}{\sqrt{1-x^2}}$ (c) $\frac{-1}{\sqrt{1+x^2}}$ (d) $\mathbf{\frac{1}{\sqrt{1-x^2}}}$

---

21) If v denotes the velocity, then $\lim_{h\to0}\frac{v(t+h)-v(t)}{h}$, defines; **2015-175 Eng**

(a) Velocity (b) Distance (c) Acceleration (d) Average velocity

Hint: $\text{Acceleration}=a=\lim_{h\to0}\frac{v(t+h)-v(t)}{h}$

---

22) $m^n.a^{mx}(\log a)^n$ is the nth derivative of; **2015-176 Eng**

(a) ma^{mx} (b) $\mathbf{a^{mx}}$ (c) m^na^{nx} (d) $(ma^{mx})^n$

Hint: $f(x)=a^{mx}\Rightarrow f'(x)=m.a^{mx}(\log a),\ f''(x)=m^2.a^{mx}(\log a)^2,........,f^{(n)}(x)=m^n.a^{mx}(\log a)^n$

---

23. if f(x,y) is a given function, then $\lim_{\Delta y\to0}\frac{f(x,y+\Delta y)-f(x,y)}{\Delta y}=$? 2016

a)f_x b)f_y c)f(x,y) d)non of the above

---

24. for a function f(x,y,z)=xyzsin(xyz), $\frac{d}{dz}$f(1,1,π/2)= 2017

a)π/2 b)3π/2 c)π d)1

---

25. if y= cosec^{-1} (e)$^{-x}$, then dy/dx = 2017

a)$\frac{e^{-x}}{\sqrt{e^{-2x}-1}}$ b)$\frac{-e^{-x}}{\sqrt{e^{-2x}-1}}$ c)$\frac{+1}{\sqrt{e-2x-1}}$ d)$\frac{-1}{\sqrt{e^{-2x}-1}}$

---

26. the slope of the tangent to each point on the graph is definetly measured by: 2018

a)f(x) b)f(y) c)f ‘ (x) d)f(f(x)) dx

---

27. a particle moves along a curve with position R = cos $\hat{\imath}$ + t$\hat{\jmath}$ + sin t k, then its speed for t=2 sec, will be: 2018

a)$\sqrt{2}$ b)$\sqrt{3}$ c)1 d) none of the above

---

28. the derivative of the function in [cos(lnx)] is; 2018

a)$\frac{x}{\tan(in\ x)}$ b)$\frac{tan(in\ x)}{x}$ c)-$\frac{tan(in\ x)}{x}$ d)$\frac{cot(in\ x)}{x}$ e) none of them

---

29. if z = f(x,y) is a function of the two variables x and y, then Fx will be; 2018

A) $\lim_{\Delta x\to 0}\frac{f(x+\Delta x,y)-f(x,y)}{\Delta y}$ B) $\lim_{\Delta x\to 0}\frac{f(x+\Delta x)-f(x,y)}{\Delta y}$
c) $\lim_{\Delta x\to 0}\frac{f(x+\Delta x,y)-f(x,y)}{\Delta x}$ D) $\lim_{\Delta x\to 0}\frac{f(x,y+\Delta y)-f(x,y)}{\Delta y}$

30. $\frac{d}{dx}\frac{\sin\alpha}{\cos\alpha} =$ _____? 2018
a)-cosαsinα b)-sinαcosα c)-sinsinx d) -cosαcosx

Answers:

1. (d)	**11. (d) –cot x.cosec x**	**22. (b)**
2. (b) 0	**12. (d)**	**23.b**
3. (b)	**13. (c)**	**24.a**
4. (d)	**14. (a) – 3e–3x**	**25.c**
5. (c) Growth	**15. (c)**	**26.c**
6. (b) – tanh x.sech x	**16. (d) All of the above**	**27.**
7. (a) ,	**17. (c) 18. (c)**	**28.e**
8. (c)	**19. (c)**	**29.b**
9. (a)	**20. (d)**	**30.c**
10. (d)	**21.(c).Acceleration**	

CHAP NO 3 HIGHER ORDER DERIVATIVES AND APPLICATIONS

1) $f(x)=f(0)+xf'(0)+\frac{x^2}{2!}f''(0)+.........+\frac{x^n}{n!}f^{(n)}(0)$, is called…….. **2011-24 Eng**
(a) Taylor series (b) Binomial series (c) Laurent series (d) Maclaurin series

2) The minimum value of the function $f(x)=x^2-x-2$ is: **2011-31 Eng**
(a) – 2 (b) $\frac{-9}{4}$ (c) – 1 (d) 0

Hint: $f'(x)=2x-1=0\Rightarrow x=\frac{1}{2}$, and $f''(x)=2\Rightarrow f''\left(\frac{1}{2}\right)=2>0$, So $f(x)$ has minimum value at $x=\frac{1}{2}$, and the minimum value of f(x) is $f\left(\frac{1}{2}\right)=\left(\frac{1}{2}\right)^2-\frac{1}{2}-2=\frac{-9}{4}$

3) The critical values of $f(x)=2x^3+3x^2-12x-5$ (for relative extreme) are: **2015-24 Eng**
(a) 1 and 2 (b) -1 and -2 (c) 1 and - 2 (d) - 1 and 2
Hint: For critical values, we have (i) $f'(x)=0$, (ii) $f'(x)$ does not exist or (iii) both (i) and (ii). For the given function, we have, $f'(x)=6x^2+6x-12=0\Rightarrow x^2+x-2=0\Rightarrow x=1,-2$

4) $1-x+\frac{x^2}{2}-\frac{x^3}{6}+\frac{x^4}{24}-.........=$ **2015-64 Eng**
(a) Sinx (b) Cosx (c) e^{-x} (d) $\log x$

Hint: As $e^x=1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+\frac{x^4}{4!}+.........$, so
$$e^{-x}=1+(-x)+\frac{(-x)^2}{2!}+\frac{(-x)^3}{3!}+\frac{(-x)^4}{4!}+.......=1-x+\frac{x^2}{2}-\frac{x^3}{6}+\frac{x^4}{24}-.......$$

5. $\frac{(-1)^{n-1}(n-1)a^n}{(ax+b)^n}$ is the nth derivative of: 2016
a)f(x) = ln (ax+b) b)f(x) = ln(ax+b)$^{-n}$
c)f(x) = ln (ax+b)^n d) f(x) = ln (ax+b)

6. if y = cos^{2}x, then y_3 = _____ 2016
a)-4cos2x b)-4sin2x c) 4cos 2x d)4 sin 2x

7. $\frac{d}{dn}$(ln|x|) = 1/x, then $\int lnxdx =$
a) 1/x b)ln x c)xlnx-1 d)xlnx-x

8 the fourth derivatie of f(x) = is:
a)64 8^{4x} (log8) b)256 8^{4x} (log8)^4 c)256 8^{4x} (log8) d).64 8^{4x} (log8)^8

9. let f(x) be a function such that f '(c)=0. If f '(c) >0 then which of the following is true [2018]
a) relative mini, concave down b)relative max; concave up
c)relative max; concave down d) relative mini; concave up

Answers:

1. (d) Maclaurin series
2. (b)
3. (c) 1 and 2
4. (c)
5. a
6.a
7.a
8.c
9.b

CHAP NO 5 INTEGRATION

1) $\int e^{\sin x}\cos x dx = \ldots\ldots$ **2010-100 Eng**

(a) $\sin x.e^{\sin x}+C$ (b) $\mathbf{e^{\sin x}+C}$ (c) $\cos x.e^{\sin x}+C$ (d) None

Hint: $\int e^{f(x)}.f'(x)dx = e^{f(x)}+C \Rightarrow \int e^{\sin x}.\cos x dx = e^{\sin x}+C$

---

2) $\int \sin kx dx =$ **2010-82 Eng**

(a) $\text{Sinkx}+C$ (b) $-\text{Coskx}+C$ (c) $\mathbf{-\frac{Coskx}{k}+C}$ (d) None

Hint: $\frac{d}{dx}\left(-\frac{\cos kx}{k}+C\right)=\sin kx \Rightarrow \int \sin kx dx = -\frac{\cos kx}{k}+C$

---

3) In the fraction $\frac{4}{(x^2+1)(x^4-1)}$, the total different real factors in the denominator are: **2010-184 Eng**

(a) 6 (b) 3 (c) 4 (d) 5

Hint: $(x^2+1)(x^4-1)=(x^2+1)(x^2+1)(x^2-1)=(x^2+1)^2(x+1)(x-1)$, so total different real factors are 3

---

4) $\int xe^x dx = \ldots\ldots$ **2011-37 Eng**

(a) $\mathbf{xe^x - e^x + c}$ (b) $xe^x + e^x + c$ (c) $e^x + cx + c$ (d) $xe^x + c$

Hint: $\int xe^x dx = x\int e^x dx - \int\left(\left(\frac{d}{dx}x\right)\int e^x dx\right)dx = xe^x - \int e^x dx = xe^x - e^x + C$

---

5) $\int \frac{dx}{\sqrt{a^2-x^2}} = \ldots\ldots$ **2011-41 Eng**

(a) $\text{Cos}^{-1}\left(\frac{x}{a}\right)+c$ (b) $\text{Sin}^{-1}\left(\frac{a}{x}\right)+c$ (c) $\mathbf{Sin^{-1}\left(\frac{x}{a}\right)+c}$ (d) $\text{Sin}^{-1}x+c$

Hint: $\int \frac{dx}{\sqrt{a^2-x^2}} = \text{Sin}^{-1}\left(\frac{x}{a}\right)+c$

---

6) $\int_0^{\frac{1}{\sqrt{3}}} \frac{dx}{1+x^2} = ?$ **2011-54 Eng**

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{3}$ (d) $\mathbf{\frac{\pi}{6}}$

Hint: $\int_0^{\frac{1}{\sqrt{3}}} \frac{dx}{1+x^2} = \left[\text{Tan}^{-1}x\right]_0^{\frac{1}{\sqrt{3}}} = \text{Tan}^{-1}\left(\frac{1}{\sqrt{3}}\right) - \text{Tan}^{-1}(0) = \frac{\pi}{6}$

7) $\frac{5x+2}{(x+1)(x-2)}=$............. **2011-197 Eng**

(a) $\frac{1}{x+1}-\frac{4}{x-2}$ (b) $\frac{2}{x+1}-\frac{3}{x-2}$ (c) $\frac{5x}{x+1}-\frac{2}{x-2}$ (d) $\mathbf{\frac{1}{x+1}+\frac{4}{x-2}}$

Hint: $\frac{1}{x+1}+\frac{4}{x-2}=\frac{1(x-2)+4(x+1)}{(x+1)(x-2)}=\frac{5x-2}{(x+1)(x-2)}$

8) $\int e^{-10x}dx=$........... **2012-28 Eng**

(a) $\mathbf{\frac{e^{-10x}}{-10}+c}$ (b) e^{-10x} (c) $\frac{e^{10x}}{10}+c$ (d) $\frac{e^{-10x}}{10}+c$

Hint: $\int e^{ax+b}dx=\frac{e^{ax+b}}{\frac{d}{dx}(ax+b)}+c=\frac{e^{ax+b}}{a}+c$

9) $\int\frac{1}{x}dx=$........ **2012-90 Eng**

(a) $\log_e kx+c$ (b) $\mathbf{\log_e x+c}$ (c) $\frac{x^2}{k}+c$ (d) None

Hint: $\frac{d}{dx}(\log_e x+c)=\frac{d}{dx}(\ln x+c)=\frac{1}{x}\Rightarrow\int\frac{1}{x}dx=\log_e x+c$

10) $\int\sec^2 10x dx=$........... **2013-66 Eng**

(a) $\frac{\operatorname{cosec}^2 10x}{10}+C$ (b) $\mathbf{\frac{\tan 10x}{10}+C}$ (c) $\frac{\sec 10x}{10}+C$ (d) $\frac{\cos 10x.\operatorname{cosec}10x}{10}+C$

11) $\int x^n dx=$............ **2013-116 Eng**

(a) $\mathbf{\frac{x^{n+1}}{n+1}+C,\ n\neq-1}$ (b) $nx^{n+1}+c,\ n\neq-1$ (c) $\frac{nx^{n-1}}{n-1}+c,\ n\neq-1$ (d) $\frac{x^{n-1}}{n-1}+c,\ n\neq-1$

12) In the form of partial fractions the rational function $\frac{x^2}{(x-1)^3(x+1)}$ can be written as: **2013-46 Eng**

(a) $\frac{A}{x+1}+\frac{B}{(x-1)^3}$ (b) $\frac{A}{(x+1)^2}+\frac{Bx+C}{x+1}$

(c) $\frac{A}{x-1}+\frac{B}{(x-1)^2}+\frac{C}{(x-1)^3}+\frac{Dx+E}{x+1}$ (d) $\mathbf{\frac{A}{x-1}+\frac{B}{(x-1)^2}+\frac{C}{(x-1)^3}+\frac{D}{x+1}}$

13) $\int_1^2 xdx=$.......... **2013-143 Eng**

(a) 3 (b) $\mathbf{\frac{3}{2}}$ (c) 2 (d) $\frac{2}{3}$

Hint: $\int_1^2 xdx=\left[\frac{x^2}{2}\right]_1^2=\frac{2^2-1^2}{2}=\frac{4-1}{2}=\frac{3}{2}$

14) In the from of partial fractions, the rational function $\frac{x}{(x-1)^2(x+1)}$ can be written as: **2014-94 Eng**

(a) $\frac{A}{x+1}+\frac{B}{(x+1)^3}$ (b) $\frac{A}{(x+1)^2}+\frac{Bx+C}{x+1}$ (c) $\mathbf{\frac{A}{x-1}+\frac{B}{(x-1)^2}+\frac{C}{x+1}}$ (d) $\frac{A}{x-1}+\frac{Bx+C}{(x-1)^2}+\frac{D}{x+1}$

Hint: $\frac{x}{(x-1)^2(x+1)}=\frac{A}{x-1}+\frac{B}{(x-1)^2}+\frac{C}{x+1}$

15) $\int \operatorname{cosec}^2 kx dx = ...$ **2014-114 Eng**

(a) $-\frac{\cos kx}{k}+C$ (b) $-\frac{\sin kx}{k}+C$ (c) $-\frac{\mathbf{cot kx}}{\mathbf{k}}+\mathbf{C}$ (d) $-\frac{\tan kx}{k}+C$

Hint: $\int \operatorname{cosec}^2 kx dx = -\frac{\cot kx}{k}+C$

16) $\int \cosh kx dx = ...$ **2014-115 Eng**

(a) $\frac{\mathbf{sinh kx}}{\mathbf{k}}+\mathbf{C}$ (b) $-\frac{\cosh kx}{k}+C$ (c) $-\frac{\tanh kx}{k}+C$ (d) $-\frac{\operatorname{sech} kx}{k}+C$

Hint: $\int \cosh kx dx = \frac{\sinh kx}{k}+C$

17) $\int_1^2 x dx = ...$ **2014-135 Eng**

(a) 3 (b) 2 (c) $\frac{2}{3}$ (d) $\frac{\mathbf{3}}{\mathbf{2}}$

Hint: $\int_1^2 x dx = \left[\frac{x^2}{2}\right]_1^2 = \frac{2^2-1^2}{2} = \frac{3}{2}$

18) $\int e^{10x} dx = ...$ **2014-155 Eng**

(a) $e^{10x}+C$ (b) $\frac{\mathbf{e^{10x}}}{\mathbf{10}}+C$ (c) $10e^{10x}+C$ (d) $(10e)^x+C$

Hint: $\int e^{10x} dx = \frac{e^{10x}}{10}+C$

19) $\int u dv = ...$ **2015-14 Eng**

(a) uv (b) $\mathbf{uv - \int udu}$ (c) $u - \int vdu$ (d) All of the above

Hint: Let $u = f(x)$ and $\int g(x)dx = v \Rightarrow g(x) = \frac{dv}{dx}$, then $\int f(x).g(x)dx = f(x)\int g(x)dx - \int\left(\frac{df(x)}{dx}.\int g(x)dx\right)dx \Rightarrow$

$\int u.\left(\frac{dv}{dx}\right)dx = uv - \int\left(\frac{du}{dx}.v\right)dx \Rightarrow \int udv = uv - \int vdu$

20) $\int \frac{x}{x^2+1}dx = ...$ **2015-22 Eng**

(a) $\ln|x^2+1|+C$ (b) $\frac{\mathbf{1}}{\mathbf{2}}\ln|\mathbf{x^2+1}|+\mathbf{C}$ (c) $-\ln|x^2+1|+C$ (d) $-\frac{1}{2}\ln|x^2+1|+C$

21) $\int_0^1 \frac{1}{x^2+1}dx = ...$ **2015-57 Eng**

(a) $\frac{\pi}{2}$ (b) 2π (c) $\frac{\pi}{\mathbf{4}}$ (d) -2π

Hint: $\int_0^1 \frac{1}{x^2+1}dx = \left[\operatorname{Tan}^{-1}x\right]_0^1 = \operatorname{Tan}^{-1}(1) - \operatorname{Tan}^{-1}(0) = \frac{\pi}{4} - 0 = \frac{\pi}{4}$

22) $\int a^{kx} dx = ...$ **2015-155 Eng**

(a) $\frac{a^x}{k}+C$ (b) $\frac{a^{kx}}{k\ln a}+C$ (c) $a^{kx}\ln a + C$ (d) $\frac{\mathbf{\ln a}}{\mathbf{k}}\mathbf{a^{kx}}+C$

Hint: As $\frac{d}{dx}\left(\frac{\ln a}{k}a^{kx}+C\right)=a^{kx} \Rightarrow \int a^{kx}dx=\frac{\ln a}{k}a^{kx}+C$

---

23) The anti derivative of zero is; **2015-177 Eng**

(a) Zero (b) $+1$ (c)Any constant (d) -1

Hint: As , $\frac{d}{dx}(\text{any constant})=0$, so $\int 0dx=\text{any constant}$

24) if f(x) is integrable on the interval [a,b] and has indefinite integral F(x) , then $\int_a^b f(x)\,dx=$? 2016

a)f [b]-f(a) b) - $\int_a^b f(x)\,dx$ c)-{F(a)-F(b)} d)all of the above

25) if $\int_{-1}^{2} f(x)\,dx=6$, $\int_{-1}^{2} g(x)\,dx=9$, then $\int_{-1}^{2}[3f(x)+4g(x)]\,dx=$ [2016]

a)18 b)54 c)35 d)60

26) coordinates of the focus of the paramedical y^2 = -x is given by; [2016]

a)(,10) b)[1/4, 0] c)(4,0) d)(4,0)

27) the point $p(x_1, y_1)$ lies above the line ax+by+c=-x is given by: [2017]

a)$ax_1+by_1+c = 0, b=0$ b) $ax_1+by_1+c > 0, b < 0$

c) $ax_1+by_1+c > 0, b > 0$ d) $ax_1+by_1+c < 0, b > 0$

28) equation of a line parallel negative y-axis at a distance of b units to the left of y-axis is given by: [2017]

a) x=b b)x = -b c)y+b = 0 d)y = - b

29) the integration , $\int_e^{\ln x}\frac{1}{x}\,dx=$ ____ [2018]

a)ln(lnx) b)1-ln(ln x) c)ln(lnx)-1 d)ln (lnx) +1

30) $\int\frac{1}{\frac{1}{4}-x^2}\,dx=$ ______ [2018]

a)$\ln\left|\frac{1-2x}{1+2x}\right|$ b) $\ln\left|\frac{1+2x}{1-2x}\right|$ c) $\ln\left|\frac{4+x}{4-x}\right|$ d) $\ln\left|\frac{1+4x}{1-4x}\right|$

31) if f(-x) = - f(x), then $\int_{-3}^{3} f(x)dx=$? [2018]

a)$\int_0^3 f(x)dx$ b)$2\int_0^3 f(x)dx$ c)$3\int_0^3 f(x)dx$ d) zero

Answers:

1. (b)	12. Ans: (d)	23. (c)Any constant\
2. (c)	13. (b)	24.a
3. (b) 3	14.: (c)	25.b
4. (a)	15. (c)	26.c
5. (c)	16. (a)	27.c
6. (d)	17. (d)	28.b
7. (d)	18. (b)	29.c
8. (a)	19. (b)	30.
9. (b)	20. (b)	31.d
10. (b)	21. (c)	
11. (a)	22. (d)	

CHAP NO 6 PLANE ANALYTIC GEOMETRY-STRAIGHT LINE

1) The lines $6x+2y+8=0,\ \&\ x-3y+7=0$ are: **2010-5 Eng**

(a) Perpendicular (b) Parallel (c) Passing through origin (d) None

Hint: Here $m_1=-\frac{6}{2}=-3$ and $m_2=-\frac{1}{-3}=\frac{1}{3} \Rightarrow m_1m_2=-3.\frac{1}{3}=-1 \Rightarrow$ the lines are perpendicular

---

2) Three points A, B, C are said to be collinear if they lie on the same: **2010-69 Eng**

(a) Line (b) Plane (c) Quadrant (d) None

3) The lines represented by $x^2+5xy+y^2=0$, are…… **2010-135 Eng**

(a) Coincident (b) Perpendicular (c) Imaginary **(d) None of the above**

Hint: Equating $x^2+5xy+y^2=0$ with $ax^2+2hxy+by^2=0$, we have $a=b=1, h=\frac{5}{2}$.

As $h^2-ab=\left(\frac{5}{2}\right)^2-1.1=\frac{21}{4}>0$ and $a+b=1+1=2\neq 0$, so the lines are real, distinct and are not perpendicular.

---

4) If P_1 and P_2 are any two points on a coordinate plane then $|P_1P_2|$ denotes: **2010-161 Eng**

(a) Directed distance (b) Length (c) Undirected distance **(d) Both (b) and (c)**

Hint: $|P_1P_2|$ represents undirected distance (length) between two points P_1 and P_2.

---

5) The ratio in which y-axis divides the line joining points (2, –3) and (– 5, 6) is: **2011-61 Eng**

(a) 2 : 3 (b) 1 : 2 (c) 3 : 5 **(d) 2 : 5**

Hint: Let $k_1:k_2$ be the required ratio, then $\frac{k_1x_2+k_2x_1}{k_1+k_2}=0 \Rightarrow \frac{-5k_1+2k_2}{k_1+k_2}=0 \Rightarrow k_1:k_2=2:5$

---

6) Two lines $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$, are parallel if: **2011-67 Eng**

(a) $\mathbf{\frac{a_1}{a_2}=\frac{b_1}{b_2}}$ (b) $\frac{a_1}{a_2}=-\frac{b_1}{b_2}$ (c) $\frac{b_1}{c_2}=\frac{b_1}{c_2}$ (d) $\frac{a_1}{c_1}=\frac{a_2}{c_2}$

Hint: Two lines L_1 and L_2 are □⇔ slope of L_1 = slope of $L_2 \Leftrightarrow \frac{-a_1}{b_1}=\frac{-a_2}{b_2} \Leftrightarrow \frac{a_1}{a_2}=\frac{b_1}{b_2}$

---

7) The lines represented by $ax^2+2hxy+by^2=0$, are parallel if: **2011-71 Eng**

(a) $\mathbf{h^2-ab=0}$ (b) $h^2-ab<0$ (c) $h^2-ab>0$ (d) $h^2+ab=0$

Hint: As $\operatorname{Tan}\theta=\frac{2\sqrt{h^2-ab}}{a+b}$, so the lines are □⇔ $\theta=0°, 180° \Rightarrow \frac{2\sqrt{h^2-ab}}{a+b}=0 \Rightarrow h^2-ab=0$

---

8) Let m_1 and m_2 be the slopes of the lines L_1 and L_2 respectively L_1 is perpendicular to L_2 if: **2011-147 Eng**

(a) $m_1=m_2$ (b) $m_1m_2=1$ **(c)** $\mathbf{m_1.m_2=-1}$ (d) $m_1+m_2=0$

---

9) Straight lines represented by $ax^2+2hxy+by^2=0$ are perpendicular if: **2012-22 Eng**

(a) $h^2=ab$ (b) $ab<h^2$ (c) $h^2<ab$ **(d) a + b = 0**

Hint: The angle θ between the lines represented by the given equation is given by, $\operatorname{Tan}\theta=\frac{2\sqrt{h^2-ab}}{a+b}$

If $\theta=90°$, then $\operatorname{Tan}90°=\frac{\sin 90°}{\cos 90°}=\frac{1}{0}=\frac{2\sqrt{h^2-ab}}{a+b} \Rightarrow a+b=0$

---

10) If (x_1,y_1), (x_2,y_2), (x_3,y_3) be the vertices of a triangle ABC then the area of the triangular region is……. **2012-72 Eng**

(a) $x_1(y_2-y_3)+x_2(y_2-y_1)+x_3(y_1-y_2)$ **(b)** $\mathbf{\frac{1}{2}[x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)]}$

(c) $\frac{1}{2}[x_1(y_2+y_3)+x_1(y_2+y_1)+x_3(y_1+y_3)]$ (d) $2[x_1(y_2-y_3)+x_1(y_2-y_1)+x_3(y_1-y_3)]$

Hint: $\Delta=\frac{1}{2}\begin{vmatrix}x_1 & y_1 & 1\\ x_2 & y_2 & 1\\ x_3 & y_3 & 1\end{vmatrix}=\frac{1}{2}\{x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)\}$

---

11) The acute angle formed by two non-perpendicular intersecting lines is given by: **2012-93 Eng**

(a) $\mathbf{\tan\theta=\left|\frac{m_2-m_1}{1+m_1m_2}\right|}$ (b) $\tan\theta=\left|\frac{m_1-m_2}{1+m_2m_3}\right|$

(c) $\tan\theta = \left|\frac{m_1 - m_1}{1 - m_3 m_2}\right|$ (d) $\tan\theta = \left|\frac{1 + m_2 - m_3}{m_2 m_3}\right|$

---

12) Which of the following is correct? **2012-167 Eng**

(a) Right bisectors of a triangle are concurrent (b) Medians of a triangle are concurrent
(c) Altitudes of a triangle are concurrent **(d) All of the above**

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13) The distance "d" from the point $P(x_1, y_1)$ to the line $ax + by + c = 0$, is given by $d =$ .... **2013-63 Eng**

(a) $\frac{|ax - by + c|}{\sqrt{a^2 + b^2}}$ (b) $\frac{|ax_1 + by_1 + c|}{\sqrt{a^2 - b^2}}$ (c) $\frac{|ax + by - c|}{\sqrt{a^2 - b^2}}$ **(d)** $\mathbf{\frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}}$

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14) The coordinates of the midpoint of the line segment whose end points are $P_1(-10,4)$, $P_2(7, -5)$ are: **2013-123 Eng**

(a) $\left(4, \frac{-1}{2}\right)$ (b) $\left(\frac{2}{3}, 2\right)$ (c) $\left(\frac{3}{2}, \frac{1}{2}\right)$ **(d)** $\mathbf{\left(\frac{-3}{2}, \frac{-1}{2}\right)}$

Hint: Mid-point $= \left(\frac{-10+7}{2}, \frac{4-5}{2}\right) = \left(\frac{-3}{2}, \frac{-1}{2}\right)$

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15) Parallel sides of a trapezium are x and y. the distance between these two sides is z. Area of the trapezium = **2013-129 Eng**

(a) $\mathbf{\frac{1}{2}(x+y)z}$ (b) $\frac{(x-y)2}{z}$ (c) $2z(x+y)$ (d) $\frac{2z}{x+y}$

Hint: Area of trapezium $= \frac{1}{2}(\text{sum of} \parallel \text{sids})(\perp \text{distance between} \parallel \text{sides}) = \frac{1}{2}(x+y)z$

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16) If the point P_1 and P_2 have the coordinates $x_1 = 7$, $x_2 = -9$, then $\left|\overline{P_1P_2}\right| =$ .... **2013-146 Eng**

(a) –2 **(b) 16** (c) 2 (d) –16

Hint: $\left|\overline{P_1P_2}\right| = |x_2 - x_1| = |-9-7| = |-16| = 16$

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17) Two lines with slope m_1 and m_2 respectively are parallel if: **2013-149 Eng**

(a) $m_1 + m_2 = 0$ **(b) $m_1 - m_2 = 0$** (c) $m_1 . m_2 = 1$ (d) $m_1 = m_2$

Hint: Lines are $\parallel \Leftrightarrow m_1 = m_2 \Leftrightarrow m_1 - m_2 = 0$

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18) The distance of a point (–2, 8) from a line $4x + 3y - 11 = 0$, is: **2013-156 Eng**

(a) –6 **(b) 1** (c) 3 (d) 5

Hint: $d = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}} = \frac{|4(-2) + 3(8) - 11|}{\sqrt{4^2 + 3^2}} = \frac{5}{5} = 1$

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19) If m_1 and m_2 are the slopes of two lines l_1 and l_2 respectively, then the angle from l_1 to l_2 is given by: **2013-169 Eng**

(a) $\mathbf{Tan\theta = \frac{m_2 - m_1}{1 + m_2 m_1}}$ (b) $Tan\theta = \frac{m_2 + m_1}{1 - m_2 m_1}$ (c) $Cot\theta = \frac{m_2 - m_1}{1 + m_2 m_1}$ (d) $Cot\theta = \frac{m_2 + m_1}{1 - m_2 m_1}$

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20) $a_1x + b_1y + c_1 = 0$, $a_2x + b_2y + c_2 = 0$ and $a_3x + b_3y + c_3 = 0$ are three non-parallel lines.

These lines are concurrent if $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} =$ .... **2013-173 Eng**

(a) –1 (b) 1 **(c) 0** (d) –2

21) Distance of point $(4, -3)$ from the line $2x-5y+3=0$ is: **2014-46 Eng**

(a) $\frac{4}{5}$ (b) $\frac{26}{5}$ (c) $\frac{4}{\sqrt{7}}$ **(d) $\frac{26}{\sqrt{29}}$**

Hint: Distance "d" of (x_1, y_1) from $ax+by+c=0$, is $d=\frac{|ax_1+by_1+c|}{\sqrt{a^2+b^2}}$

22) The line $y=mx+c$ be the tangent to the parabola $y^2=4ax$ if: **2014-146 Eng**

(a) $c=\frac{a}{m}$ (b) $a=cm$ (c) $m=\frac{a}{c}$ (d) All of these

23) If $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$ by any two points in space then distance $|AB|=$............ **2014-184 Eng**

(a) $\sqrt{(x_1+x_2)^2+(y_1+y_2)^2+(z_1+z_2)^2}$ **(b) $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2+(z_2-z_1)^2}$**

(c) $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2+(z_1-z_1)^2}$ (d) $\sqrt{(x_2-x_1)^2-(y_2-y_1)^2-(z_1-z_1)^2}$

24) If m_1 and m_2 are the slopes of two lines L_1 and L_2 respectively then the angle from L_1 to L_2 is given by: **2014-194 Eng**

(a) $\tan\theta=\frac{m_2+m_1}{1-m_2m_1}$ (b) $\cot\theta=\frac{m_2-m_1}{1+m_2m_1}$ **(c) $\tan\theta=\frac{m_2-m_1}{1+m_2m_1}$** (d) $\cot\theta=\frac{m_2+m_1}{1-m_2m_1}$

25) The coordinates of the midpoint of the line segment whose end points are $P_1(-10, 4)$, $P(7, -5)$ are: **2014-195 Eng**

(a) $\left(4, \frac{-1}{2}\right)$ **(b) $\left(\frac{-3}{2}, \frac{-1}{2}\right)$** (c) $(3, 2)2$ (d) $\left(\frac{3}{2}, \frac{1}{2}\right)$

Hint: Mid-point $=\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)=\left(\frac{-10+7}{2}, \frac{4-5}{2}\right)=\left(\frac{-3}{2}, \frac{-1}{2}\right)$

26) If (x , y) are the co-ordinates of a point 'P' then the 1st component of the order pair is called: **2014-196 Eng**

(a) Abscissa (b) $y-$coordinate (c) Ordinate (d) $xy-$coordinate

27) The lines $a_1x+b_1y+c_1=0$, $a_2x+b_2y+c_2=0$ and $a_3x+b_3y+c_3=0$, are three non-collinear lines, then these three lines are concurrent if: **2015-28 Eng**

(a) $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}=-1$ (b) $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}=1$ **(c) $\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}=0$** (d) $\begin{vmatrix} b_1 & c_1 & c_1 \\ c_2 & b_2 & a_2 \\ b_3 & a_3 & c_3 \end{vmatrix}=0$

28) If $\frac{m_1-m_2}{1+m_1m_2}<0$, then the angle formed will be: **2015-58 Eng**

(a) Acute **(b) Obtuse** (c) Right (d) All of the above

Hint: As $\tan\theta=\frac{m_1-m_2}{1+m_1m_2}<0 \Rightarrow \tan\theta<0 \Rightarrow 90°<\theta<180°$

29) The slope of a line is a measure of the: **2015-87 Eng**

(a) Height of a line **(b) Steepness of a line** (c) Thickness of a line (d) None of these

30) If $h^2<ab$, then the equation $ax^2+2hxy+by^2=0$, represents a pair of straight lines, which are; **2015-157 Eng**

(a) Real (b) Coincident **(c) Imaginary** (d) Perpendicular

Hint: $ax^2+2hxy+by^2=0 \Rightarrow b\left(\frac{y}{x}\right)^2+2h\left(\frac{y}{x}\right)+a=0 \Rightarrow \frac{y}{x}=\frac{-2h\pm\sqrt{4h^2-4ab}}{2b} \Rightarrow y=\left(\frac{-h\pm\sqrt{h^2-ab}}{b}\right)x$.

If $h^2 < ab \Rightarrow h^2 - ab < 0 \Rightarrow \sqrt{h^2 - ab}$ is imaginary. Hence the lines are imaginary.

31) If m_1 and m_2 are the slopes of two lines L_1 and L_2 respectively, then the angle from L_1 to L_2 is given by;

(a) $\mathbf{Tan\theta = \frac{m_2 - m_1}{1 + m_1 m_2}}$ (b) $Tan\theta = \frac{m_2 + m_1}{1 + m_1 m_2}$ (c) $Tan\theta = \frac{m_2 + m_1}{1 - m_1 m_2}$ (d) $Tan\theta = \frac{m_1 - m_2}{1 + m_1 m_2}$

32) the order of steepness of lines: [2017]
L_1; y-x+3=0, L_2= y - (1/3)x -5,, L_3 = y-0.3x+6 is:
a)L_1 , L_2 ,L_3 b) L_2 ,L_3, L_1 c),L_3 ,L_2 ,L_1 d) L_1 , L_3 ,L_2

34) if an ABC is anequatlateral triangle with side ''C'' , then the area is; [2018]
a)$\frac{\sqrt{3}c}{4}$ b)$\frac{\sqrt{3}\,c^2}{4}$ c)$\frac{\sqrt{3}c}{2}$ d) $\frac{\sqrt{3}\,c^2}{2}$

35) which pair of lines have a single point of intersection ? [2018]
a)x+y=1, 2x+2y=2 b) x+y=1, x+y=0 c)x+y=1, x-y=0 d) none of the above

36) the line ax+by+c=0, will be verticle, when __________? [2018]
a) B=0 b)A=0 c)A≠0,b≠0 d)A≠0,a≠0

37) the shortest distance of line ax+by+c=0 from origin is: [2018]
a)$\frac{lax_1 + by_{1+cl}}{\sqrt{a^2+b^2}}$ b)$\frac{lax+by+cl}{\sqrt{a^2+b^2}}$ c) $\frac{lcl}{\sqrt{a^2+b^2}}$ d) $\sqrt{a^2+b^2}$

Answers:

1.a	9.d	17.b	25.b	33.c
2.a	10.b	18.b	26.a	34.b
3.d	11.a	19.a	27.c	35.c
4.d	12.d	20.c	28.b	36.c
5.d	13.d	21.d	29.b	37. a
6.a	14.d	22.a	30.c	
7.a	15.b	23.b	31.a	
8.c	16.b	24.c	32.c	

CHAPTER NO 7 CONICS-I

1) Which of the following points lie on the circle $x^2 + y^2 - 13x - 5y + 16 = 0$? **2010-40 Eng**
. **(a)** $\mathbf{(1, 1)}$ (b) $(3, -1)$ (c) $(0, 0)$ (d) Both (a)&(b)

Hint: As $1^2 + 1^2 - 13(1) - 5(1) + 16 = 18 - 18 = 0$, so $(1, 1)$ lies on the given circle

2) The lines represented by $x^2 + 5xy - y^2 = 0$, are: **2010-103 Eng**
(a) Parallel (b) Coincident **(c) Perpendicular** (d) None

Hint: Equating $x^2 + 5xy - y^2 = 0$ with $ax^2 + 2hxy + by^2 = 0$, we have, $a = 1, h = \frac{5}{2}, b = -1$. Since $a + b = 1 + (-1) = 0$, so the lines are perpendicular.

3) If a circle has its centre at the origin then it passes through **2010-147 Eng**
(a) X – axis (b) Y – axis **(c) Both (a) &(b)** (d) None

Hint: A circle having centre at the origin passes through both the X – axis and Y – axis.

4) The length of a quarter of a circle, whose radius is r_1 is: **2011-44 Eng**
(a) $4\pi r_1$ (b) $2\pi r_1$ (c) $\frac{1}{4}\pi r_1$ **(d)** $\mathbf{\frac{1}{2}\pi r_1}$

Hint: Circumference of a circle of radius $r_1 = 2\pi r_1$, so length of a quarter of the circle $= \frac{2\pi r_1}{4} = \frac{1}{2}\pi r_1$

5) The radius of the circle $x^2 + y^2 + 2gx + 2fy + c = 0$, is: **2011-84 Eng**
(a) $\sqrt{g^2 + f^2 + c}$ (b) $\sqrt{g^2 - f^2 + c}$ **(c)** $\mathbf{\sqrt{g^2 + f^2 - c}}$ (d) $g^2 + f^2 - c$

6) The equation $ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0$ represent a circle if: **2011-87 Eng**

(a) $a \neq b,\ h \neq 0$ (b) $a \neq b,\ h = 0$ (c) $a = b,\ h \neq 0$ The line y = mx + c , becomes tangent to the circle $x^2 + y^2 = a^2$, If _______ **2012-38 Eng**

(a) $c = \frac{a}{m}$ (b) $c = \frac{m}{a}$ **(d) $a = b,\ h = 0$** (d) $c = \pm a\sqrt{1-m^2}$

7) If $x^2 + y^2 + 2gx + 2fy + c = 0$ is the general form of the equation of circle, then radius = **2013-179 Eng**

(a) $c = \pm a\sqrt{1+m^2}$ (b) $g^2 + f^2 - c$ (c) $\sqrt{g^2+f^2+c}$ (d) $g^2 + f^2 + c$

8) The equation of the circle whose centre is the origin and radius is 3 units is: **2013-183 Eng**

(a) $x^2 + y^2 = 3$ (b) $x^2 - y^2 - 3$ **(a) $\sqrt{g^2+f^2-c}$** (d) $x^2 - y^2 = 9$

Hint: The equation of circle whose centre is the origin and radius is **r**, is: $x^2 + y^2 = r^2$

9) The radius of the circle passing through the point $(6, 2)$ and two of whose diameters are x + y = 6 and x +2y = 4 is: **2014-116 Eng**

(a) 4 (b) 5 (d) $\sqrt{2}$

Hint: Here point= $P(6, 2)$ and centre $C(x, y) = C(8, 2)$ is obtained by solving the given equations of the diameters,

So radius $= r = |\overline{PC}| = \sqrt{(8-6)^2 + (2-2)^2} = 2$

10) Radius of a circle whose equation is $x^2 + y^2 - 6x + 8y + 21 = 0$ is: **2014-144 Eng**

(a) 79 **(c) 2** (c) 4 (d) 5

Hint: Equating the given equation of circle with $x^2 + y^2 + 2gx + 2fy + c = 0$, we have , $g = -3,\ f = 4,\ c = 21$

So radius is $r = \sqrt{g^2 + f^2 - c} = \sqrt{(-3)^2 + 4^2 - 21} = \sqrt{25-21} = \sqrt{4} = 2$

11) Equation of the normal at (x_1, y_1) to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$, is…. **2014-186 Eng**

(a) $y_1 - y = \frac{y_1 - f}{x_1 - g}(x + x_1)$ (b) $y_1 + y = \frac{y_1 + f}{x_1 - g}(x - x_1)$

(c) $y + y_1 = \frac{y_1 - f}{x_1 - g}(x + x_1)$ $\mathbf{y - y_1 = \frac{y_1 + f}{x_1 + g}(x - x_1)}$

Hint: $\frac{d}{dx}(x^2 + y^2 + 2gx + 2fy + c) = \frac{d}{dx}(0) \Rightarrow 2x + 2y\frac{dy}{dx} + 2g + 2f\frac{dy}{dx} = 0 \Rightarrow (y+f)\frac{dy}{dx} = -(x+g) \Rightarrow \frac{dy}{dx} = -\frac{(x+g)}{(y+f)}$

$m = \left[\frac{dy}{dx}\right]_{(x_1, y_1)} = -\frac{(x_1+g)}{(y_1+f)} \Rightarrow \frac{-1}{m} = \frac{y_1+f}{x_1+g}$. The equation of normal is $y - y_1 = \frac{-1}{m}(x - x_1)$

$\Rightarrow y - y_1 = \frac{y_1 + f}{x_1 + g}(x - x_1)$

12) If for the circle $x^2 + y^2 + 2gx + 2fy + c = 0$, $g^2 + f^2 - c < 0$, then it is called: **2015-12 Eng**

(a) Real circle (b) Point circle . (c) Imaginary circle (d) Circum circle

Hint: As $r = \sqrt{g^2 + f^2 - c}$, so if $g^2 + f^2 - c < 0$, then r is imaginary and hence the circle is imaginary.

13) Equation of the normal at (x_1, y_1) to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$, is. **2015-29 Eng**

(a) $y_1 - y = \frac{y_1 - f}{x_1 - g}(x + x_1)$ (b) $y_1 + y = \frac{y_1 + f}{x_1 - g}(x - x_1)$

(c) $y + y_1 = \frac{y_1 - f}{x_1 - g}(x + x_1)$ **d.** $\mathbf{y - y_1 = \frac{y_1 + f}{x_1 + g}(x - x_1)}$

Hint: Same as question No 12.

14) slope of the tangent to the circle $x^2 + y^2 +2 = 0$, which makes an angle 30^0 with the x-axis is ; [2016]
a)0 b)-1 c)$\frac{1}{\sqrt{3}}$ d) undefined

15) in equation $2x^2 + 2y^2 +4x-6y+8 = 0$, centre is; [2018]
a)(-2,3) b)(-ag, -af) c)(-1, 3/2) d) (2,3)

16) equation of normal to the circle $x^2 + y^2 = a^2$ at the point (x_1,y_1) is; [2016]
a) $xx_1 - yy_1 =0$ b) $xx_1 + yy_1 = 0$
c) $xx_1 - yy_1 = 0$ d) $xx_1 - yy_1 = 0$

17) equation of tangent to the circle $x^2 + y^2 = a^2$ at the point (x_1,y_1) is; [2017]
a) $xx_1 - yy_1 =0$ b) $xx_1 + yy_1 = a^2$
c) $xx_1 - yy_1 = a$ d) $xx_1 - yx_1 = a^2$

18) what is the circumference of the circle whose area is 100π? [2018]
a)10π b)20π c)10 d)20

19) a circle of radius 3 touch both the axia of 4h quadrant has centre. [2018]
a)(,-3) b)(-3,3) c)(3,3) d) (-3,-3)

20) choose the correct option for the lin ex=8, and circle $x^2 + y^2 -6x-4y-12=0$; [2018]
a) touch each other b) intersect each other c)passes outside d) none

21) when equation of normal to the circle $x^2 + y^2 +5=0$ is 2x-y=0, then equation of tangent will be; [2018]
a)x-2y=5 b)x+2y=5 c)2x+y=5 d) 2x+y=0

22) equation of centre at (-5.4) and tangent to y-axis is ; [2018]
a)$(x+5)^2 - (y-4)^2 = 25$ b) $(x+5)^2 - (y-4)^2 = 16$
c) $(x+5)^2 + (y-4)^2 = 25$ d) $(x+5)^2 + (y-4)^2 = 16$

Answer Key

1. (a)	7. (a)	15.a
2. (c) Perpendicular	8. (a)	16.a
	9. (c) x2 + y2 – 9=0	17.b
3. (c) Both (a) &(b)	10. (c) 2	18.b
	11. (b) 2	19.a
4. (d)	12. (c) Imaginary circle	20.c
5. (c)	13. d.	21.b
6. (d)	14. c	22.b

Chapter No 8 Conics-II

1) The graph of $y^2 = 4ax$ is symmetric about: **2010-1 Eng**
(a) $y-axis$ **(b) $x-axis$** (c) Origin (d) None

Hint: The graph of a parabola is symmetric about the $x-axis$ (or $y-axis$) according as its standard equation containsthe "y^2 – term" (or "x^2 – term").

2) The asymptotes of the hyperbola $\frac{x^2}{9}-\frac{y^2}{4}=1$, are: **2010-16 Eng**
(a) $y=\pm\frac{2}{3}x$ (b) $x=\pm\frac{2}{3}y$ (c) $y=\pm x$ (d) None

Hint: Asymptote of the parabola are $\frac{x^2}{9}-\frac{y^2}{4}=0 \Rightarrow y=\pm\frac{2}{3}x$

3) Equation of latus rectum of the parabola $y^2 = 4ax$ is: **2010-39 Eng**
(a) $x=a$ (b) $y=0$ (c) $x+a=0$ (d) $x=0$

Hint: As the equation of parabola contains y^2 term, the axis of symmetry of the parabola is the $x-$axis sothe equationof latus-rectum is $x = a$, if $a > 0$ and $x = -a \Rightarrow x + a = 0$, if $a < 0$.

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4) The eccentricity of hyperbola is: **2011-81 Eng**
(a) $e < 0$ (b) $0 < e < 1$ (c) $e = 1$ **(d) $e > 1$**

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5) The asymptotes of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ are; **2012-32 Eng**

(a) $x = \pm\frac{b}{a}y$ (b) $y = \pm\frac{a}{b}x$ **(c) $y = \pm\frac{b}{a}x$** (d) $x = \pm\frac{a}{b}y$

Hint: $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0 \Rightarrow \frac{y^2}{b^2} = \frac{x^2}{a^2} \Rightarrow y = \pm\frac{b}{a}x$

---

6) Equation of the parabola with vertex at (0,0) and directrix y + 2 = 0 is; **2012-68Eng**
(a) $y^2 = 8x + 8y$ (b) $x^2 = -8y$ (c) $y^2 = 8x$ **(d) $x^2 = 8y$**

Hint: $y + 2 = 0 \Rightarrow y = -2 = -a \Rightarrow a = 2$, so equation of parabola is $x^2 = 4ay \Rightarrow x^2 = 8y$

---

7) The eccentricity and foci of the ellipse $16x^2 + 25y^2 = 400$ are: **2012-75 Eng**

(a) $-\frac{3}{5}(0, \pm 3)$ (b) $-\frac{4}{5}(0, \pm 4)$ **(c) $\frac{3}{5}, (\pm 3, 0)$** (d) $\frac{4}{5}(\pm 4, 0)$

Hint: $16x^2 + 25y^2 = 400 \Rightarrow \frac{x^2}{5^2} + \frac{y^2}{4^2} = 1 \Rightarrow a = 5, b = 4$. Hence, $e = \frac{\sqrt{a^2 - b^2}}{a} = \frac{\sqrt{5^2 - 4^2}}{5} = \frac{3}{5}$

and $F(\pm ae, 0) = F\left(\pm 5 \times \frac{3}{5}, 0\right) = F(\pm 3, 0)$

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8) Conic is a parabola if: **2012-115 Eng**

(a) $e = 1$ (b) $e = \frac{1}{2}$ (c) $e = \frac{2}{1}$ (d) $e = 2$

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9) The line y = mx + c is tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, If………. **2012-190 Eng**

(a) $c = \pm\sqrt{a^2m^2 + b^2}$ (b) $c = \pm\sqrt{a^2m^2 - b^2}$ (c) $c = \pm\sqrt{1 + m^2}$ (d) $c = \pm\sqrt{a^2 + b^2m^2}$

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10) Length of the latus-rectum of $3x^2 = 4y$ is: **2013-153 Eng**

(a) 4 (b) –4 **(c) $\frac{4}{3}$** (d) $\frac{3}{4}$

Hint: $3x^2 = 4y \Rightarrow x^2 = \frac{4}{3}y = 4py \Rightarrow 4p = \frac{4}{3} \Rightarrow$ length of latus – rectum $= |4p| = \left|\frac{4}{3}\right| = \frac{4}{3}$

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11) Equation of the ellipse is: **2013-186 Eng**

(a) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (b) $\frac{a^2}{x^2} + \frac{y^2}{b^2} = 1$ (c) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (d) $\frac{x^2}{a^2} + \frac{b^2}{y^2} = 1$

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12) Equation of the normal at the point (x_1, y_1) to the parabola $y^2 = 4ax$ is: **2013-189 Eng**

(a) $y - y_1 = \frac{-y_1}{2a}(x - x_1)$ (b) $y - y_1 = \frac{2a}{y_1}(x - x_1)$ (c) $y + y_1 = \frac{2a}{y_1}(x + x_1)$ (d) $y - y_1 = 2a(x - x_1)$

Hint: $\frac{dy^2}{dx} = \frac{d(4ax)}{dx} \Rightarrow 2yy' = 4a \Rightarrow y' = \frac{2a}{y} \Rightarrow m = \frac{2a}{y_1} \Rightarrow \frac{-1}{m} = \frac{-y_1}{2a}$. Hence the equation of normal at (x_1, y_1) is

$y - y_1 = \frac{-1}{m}(x - x_1) \Rightarrow y - y_1 = \frac{-y_1}{2a}(x - x_1)$

---

13) The conic having eccentricity e > 1, is called: **2013-193 Eng**
(a) Hyperbola (b) Ellipse (c) Parabola (d) Circle

14) If (0,0) and (0 ,– 3) are respectively the vertex and focus of a parabola then its equation is: **2014-124 Eng**

(a) $y^2 = 12x$ (b) $y^2 = -12x$ (c $x^2 = 12y$ **(d) $x^2 = -12y$**

Hint: Here $V(0,0)$ and $F(0, p) = F(0, -3) \Rightarrow p = -3$, As the axis of parabola is the y-axis, so $x^2 = 4py \Rightarrow x^2 = -12y$

15) For the ellipse $16x^2 + 25y^2 = 400$ the eccentricity, $e = ...$ **2014-125 Eng**

(a) $\frac{2}{5}$ (c) $\frac{4}{5}$ (d) $\frac{1}{5}$

Hint: $16x^2 + 25y^2 = 400 \Rightarrow \frac{x^2}{5^2} + \frac{y^2}{4^2} = 1 \Rightarrow a = 5, b = 4$, so $e = \frac{\sqrt{a^2 - b^2}}{a} = \frac{\sqrt{5^2 - 4^2}}{5} = \frac{\sqrt{9}}{5} = \frac{3}{5}$

16) When e = 1 the conic is a/an…….. **2014-126 Eng**

(a) Circle (b) Ellipse (c) Hyperbola **(d) Parabola**

17) Letus rectum of the parabola $3x^2 = 4y$ is: **2014-136 Eng**

(a) $x = \frac{1}{3}$ (b) $x = -\frac{4}{3}$ (c) $y = \frac{3}{4}$ **(d) $y = \frac{1}{3}$**

Hint: $3x^2 = 4y \Rightarrow x^2 = \frac{4}{3}y = 4py \Rightarrow p = \frac{1}{3}$. Since the axis of parabola is the y-axis, so latus-rectum is $y = p \Rightarrow y = \frac{1}{3}$

18) Length of latus-rectum of $3x^2 = 4y$, is……….. **2015-59 Eng**

(a) 4 (b) –4 **(c) $\frac{4}{3}$** (d) $\frac{3}{4}$

Hint: $3x^2 = 4y \Rightarrow x^2 = \frac{4}{3}y = 4py \Rightarrow 4p = \frac{4}{3}$, i.e., length of latus rectum $= 4p = \frac{4}{3}$

19) In a hyperbola, $e = ...$ **2015-66 Eng**

(a) $\sqrt{\frac{a^2 + b^2}{a^2}}$ **(b) $\sqrt{\frac{a^2 - b^2}{a^2}}$** (c) 1 (d) 0

20) Equation of the normal at the point (x_1, y_1) to the parabola $y^2 = 4ax$, is: **2015-142 Eng**

(a) $yy_1 = 2a(x + x_1)$ **(b) $y - y_1 = \frac{-y_1}{2a}(x - x_1)$** (c) $y - y_1 = \frac{-2a}{y_1}(x - x_1)$ (d) $y - y_1 = 2a(x - x_1)$

Hint: $\frac{dy^2}{dx} = \frac{d}{dx}(4ax) \Rightarrow 2y\frac{dy}{dx} = 4a \Rightarrow \frac{dy}{dx} = \frac{2a}{y} \Rightarrow m = \left[\frac{dy}{dx}\right]_{(x_1, y_1)} = \frac{2a}{y_1} \Rightarrow \frac{-1}{m} = \frac{-y_1}{2a}$. The equation of normal is $y - y_1 = \frac{-1}{m}(x - x_1) \Rightarrow y - y_1 = \frac{-y_1}{2a}(x - x_1)$

21) The conic having eccentricity $e > 1$, is called: **2015-143 Eng**

(a) Hyperbola (b) Ellipse (c) Parabola (d) Asymptotes

22) What will be equation of parabola having focus at $F(0, -2)$ and directrix $= 2$? **2015-194 Eng**

(a) $x^2 = 2y$ (b) $y^2 = 2x$ **(c) $x^2 = -8y$** (d) $y^2 = 8x$

Hint: $F(0, -2) = F(0, p) \Rightarrow p = -2$. As the $x-$coordinate of the focus is zero so the focus is on $y-$ axis. Hence the equation of parabola is, $x^2 = 4py \Rightarrow x^2 = 4(-2)y \Rightarrow x^2 = -8y$

23) for a parabola y^2 = -4ax, the end points of latus-rectum are: [2016]

a)(-a,+2a), (-a,-2a) b)(a,2a),(a,-2a) c) (2a,a), (-2a.a) d) (2a,2a),(-2a,-2a)

24) the tangent line x+y=0, intersects the parabola $x^2 = y_1$ at:]2016\

a)two coincident point b) two real distinct point c) two imaginary points d) all

25) the eccentricity of an ellipse, $9x^2 + 4y^2$ = 36, is [2016]

a)3/5 b)$\frac{\sqrt{5}}{3}$ c)$\frac{3}{\sqrt{5}}$ d) $\frac{5}{\sqrt{3}}$

---

26) equation of a tangent to the parabola $y^2 + 4zx$ in the slope form is : [2016]
a) $y = mx + \frac{m}{a}$ b)$y= mx + \frac{a}{m}$ c)$my = m^2 x + a^2$ d)non of these

---

27) the asymptotes of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$is given by; [2017]
a)$y = \pm \frac{b}{a} x$ b) $y = \pm \frac{a}{b} x$ c) $y = \pm \frac{c}{a} x$ d) $y = \pm \frac{a}{c} x$

---

28) in the equation $4px = y^2$, if p>0, then the parabola is symmetric with respect to: [2017]
a)negative x-axis b)positive y-axis c) positive x-axis d) x-axis

---

29) in the horizontal ellipse, I f foci are F_1 (h-c, k); [2017]
a)$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ b)$\frac{(x-k)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ c)$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ d) $\frac{(x-c)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$

---

30) the line 2x-y+c = 0 wil touch the ellipse $\frac{x^2}{3} + \frac{y^4}{4} = 1$, if c=________ [2017]
a) ± 4 b)± 7 c)± 9 d)± 11

---

31) the equation of ditrix for parabola $y^2 = -4px$ is: [2017]
a)y=-p b)y=p c)x=-p d)x=p

---

32) the major axis of the ellipse $4x^2 + 25y^2 - 8x + 100y + 4 = 0$
a)parallel to x-axis b)parallel to y-axis c)on x-axis d)on y-axis

---

33) choose the correct option ofr parabola $f(x) = -4x^2 + 4x - 5$; [2018]
a)vertex (-2,1) open upwards b) vertex (2,1) opens downward
c)veertex (2,-1) opens downward d) vertex (2,1) opens upward

---

34) a line y=mx+c will be tangent to parabola $y^2 = 4px$, if_____ [2018]
a)p+mc=0 b)pm=c c)pc-m=0 d)p-mc=0

---

35) the equation of the ellipse whose foci are $(\pm 2,0)$ and eccentricity ½ is ; [2018]
a)$\frac{x^2}{12} + \frac{y^2}{16} = 1$ b)$\frac{x^2}{12} + \frac{y^2}{12} = 1$ c)$\frac{x^2}{16} + \frac{y^2}{8} = 1$ d)$\frac{x^2}{12} - \frac{y^2}{16} = 1$

Answer Key

1. (b) x axis	13. (a) Hyperbola	25.B
2. (a)	14. (d) x2 = −12y	26.B
3. (a)	15.	27.A
4. (d) e > 1	16. (d) Parabola	28.C
5. (c)	17. (d)	29.C
6. (d) x2 = 8y	18. (c)	30.A
7. (c)	19. (b)	31.D
8. (a) e = 1	20. (b)	32.A
9. (a)	21. a) Hyperbola	33.C
10. (c)	22. (c)	34.D
11. (a)	23.C	35.C
12. (a)	24.B	

CHAPTER NO 9
DIFFERENTIAL EQUATIONS

1) Power of highest derivative appearing in a differential equation is called its: **2012-152 Eng**
.(a) Degree (b) Order (c) Power (d) Index

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2) Degree of the equation $\left(\frac{dy}{dx}\right) + \left(\frac{d^2y}{dx^2}\right) + y = 3$, is…….. **2015-89 Eng**
(a) 5 (b) 2 (c) 3 **.(d) 1**

Hint: If a D.E is free from radicals and fractions, then the exponent of the highest derivative occurring in the D.E is called degree of the D.E.

3) non-linear equation in the following equation is : [2017]
a)$\frac{dv}{dt}$=-32 b) $\frac{dy}{dx} = x + 1$ c)$\frac{d^2y}{dx^2} + 2x\,\frac{dy}{dx} + y = 3$ d))$\frac{d^2y}{dx^2} + 4y\,\frac{dy}{dx} + y$ =cosx

4) $2x^2 + 2y^2 - xy - 2y = 0$, does nor represent a ciccle, because; [2016]
a)degree is not two b)involving the term xy c) coefficient of x^2 and y^2 are equal d) none

5) ady +by sin x dx=0 is; [2017]
a)non-linear differenctial equation b) homogenous differential equations
c)separable differential equation d) non separable differential equation

6) which of the following ordinary differential equation is non-linear ; [2018]
a)$\frac{d^2y}{dx^2} + 2x\,\frac{dy}{dx} + y = 3$ b)$\frac{d^2y}{dx^2} + 4y\,\frac{dy}{dx} + y$ =cosx
c)$\frac{dv}{dt}$=-32 d)$\frac{d^2y}{dx^2} + 3\,\frac{dy}{dx} + 11y = 3x$

7) the differential equation of orthogonal trajectories of the curve $y=cx^3$ is; [2018]
a)$\frac{dy}{dx} = -\frac{3y}{x}$ b)$\frac{dy}{dx} = -\frac{x}{3y}$ c)$\frac{dy}{dx} = -\frac{-3x}{y}$ d)$\frac{dy}{dx} = -\frac{3x}{y}$

Answer Key

1.(a) Degree
2.(d) 1
3.D
4.B
5.A
6.B
7.

CHAPTER NO 10

PARTIAL DIFFERENTIATION

1) If $f(x,y,z) = e^x + \sin(y+z)$, then $\frac{\partial f}{\partial x} + \frac{\partial f}{\partial z}$ at the point $(0, 0, 0)$ is; **2015-Eng**

(a) 0 (b) 1 (c) 2 (d) 5

Hint: $\frac{\partial f}{\partial x} + \frac{\partial f}{\partial z} = \frac{\partial}{\partial x}(e^x + \sin(y+z)) + \frac{\partial}{\partial z}(e^x + \sin(y+z)) = e^x + 0 + 0 + \cos(y+z) = e^x + \cos(y+z)$

$\Rightarrow \left[\frac{\partial f}{\partial x} + \frac{\partial f}{\partial z}\right]_{(0,0,0)} = \left[e^x + \cos(y+z)\right]_{(0,0,0)} = e^0 + \cos 0 = 1 + 1 = 2$

2) For a homogeneous function $f(z)$ of degree n, if $x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y} = nz$, then this rule is; **2015Eng**

(a) Mean value theorem(b) Euler theorem (c) Taylor's theorem (d) Maclaurin's theorem

3) If f(x,y) = sin xy, then f_y = ? [2015]
a)cosxy b)xcosxy c)-xcosxy d)xycosxy

4) Newton Raphson method for numerical approximation of a function f(x)=0 is: [2016]
a)$x_{i+1} = x_i - \frac{f(x)_i}{f'(x)_i}$, I = 0,1,2,3,,,,,,, b) $x_{i+1} = x_i + \frac{f(x)_i}{f'(x)_i}$, I = 0,1,2,3,,,,,,,
c)c= a- $\frac{(a-b)f(a)}{f(a)-f(b)}$ d) c= a + $\frac{(a-b)f(a)}{f(a)-f(b)}$

5) if f(x,y,z) = x+y = ½ then 1/az f(0,0,z): [2016]
a)z^2 b)$1/z^2$ c)$2+ 1/z^2$ d)$-1/z^2$

6) if $f(x,y,z) = x^2ye^{2x} + (x+y-z)^2$, then $\frac{\partial}{\partial x}$f(x,x,x)=
a)$3x^3e^{2x}+2x^2e^{2x}+2x$ b)$2^3e^{2x}+2x$ c)$2x^3e^{2x}+2x^2e^{2x}+2x$ d)$3x^2e^{2x}+2x$

7) Newton Raphson method is; [2017]
a)two points iterative b)one point iterative
c) many points iterative d) infintes points iterative

8) Z = f(x,y) = $\frac{x^3e^{\frac{y}{x}}}{y}$ - $3\frac{y^2}{x}$ $\sqrt{x^2y^2}$ is homogenous of degree: [2017]
a)0 b)1 c)2 d)3

9) if an equation involves the derivative of dependent variable of one independent variable, is called ; [2017]

a)ordinary differential equation b) partial differential equation
c) integral equation d) partial integro-diggerntial equation

10) y = x+aA is a solution of D.E. [2017]
a)dy+dx=0 b)dy/dx=0 c)dy/dx=1 d)dy/dx=C

11) which function obeys Euler's theorm directly? [2018]
a)$Tan^{-1}(\frac{x^2+y^2}{x-y})$ b)$\sin(\frac{xy^2}{x^3+y^3})$ c) $Tan(\frac{x^2-y^2}{x+y})$ d)$\ln(\sqrt{x}-\sqrt{y})$

12) if the initial approximation is $x_0 = 0$, then for which of the following function Newton's Raphsonis applicable ; [2018]
a)$f(x) = x^3 + 2x - 1$ b)f(x) = 1/sinx c)f(x)=1/x d)f(x) = cot x

ANSWERS

1. **(c) 2**
2.(b) Euler theorem
3.B
4.A
5.B
6.C
7.B
8.D
9.A
1.C
11.B
12.A

ENGLISH;

ETEA medical + engineering 2019

1) Sadia wore her rain boots;______ her feet stayed dry during the storm. **2019-Med** — B
a) however
b) therefore
c) on the other hand
d) still
ans; b

2) Anum asked me,"did you see the drama on television, last night" [choose the correct indirect speech] **2019-Med** — B
a) Anum asked me wheather I saw the dram on television the earlier night.
b) Anum asked me wheather I had seen the drama on television the earlier night.
c) Anum asked me did I see the drama on television the last night.
d) Anum asked me wheather I had seen the drama on television last night.

3) Donot make so much noise, Farrah ____ to study for her ESL test. — D
a) Try b) tries
c) tried d) is trying

4) Zara changed the flat tire. Choose the passive voice — A
a) The flat tire was changed by Zara
b) The flat tire is changed by Zara
c) The flat tire has been changed by Zara
d) The flat tire had changed by Zara

5) Sorry, she can't come to the phone. She _____bath — B
a) Is having b) having
c) have d) has

6) Choose the word nearest in meaning to "ENIGMA" — B
a) Evaluation b) puzzle
c) answer d) account

7) When I went back to my home town three years ago, I found that a lot of changes — A
a) Had taken place b) have taken place
c) Are taken place d) were taken place

8) Choose the correct sentence — A
a) He is clever but he lacks experience
b) He is clever but he is lacking experience.
c) He is clever but he lacked experience
d) He is clever but he is lack experience

9) Look! A hamster ______ by a cat **2019-Med** — C
a) Has been chased b) was being chased
b) Is being chased d) is chased

10) Choose the word opposite in meaning to ''VOCIFEROUS'' **2019-Med** — A
a) Silent b) boisterous
c) blatant d) noisy

11) I'm sorry the house is not available any longer, it_____to a timber tycoon — D
a) Was being sold b) will be sold
c) is sold d) has been sold

12) I always like to lean the side of mercy — B
a) Over b) one
c) towards d) about

13) _____ you win first place, you will receive a prize — B
a) Whenever b) if
c) unless d) so forth

14) The train was ______ — B
a) Halt b) halted
c) had halted d) has halted

15) Be patient, please **2019-Med** Choose the passive voice — A
a) You are requested to be patient.
b) You are ordered to be patient
c) You are advised to be patient
d) You are embarrassed to be patient

16) Mr. Saad ____his teeth before breakfast every morning — C
a) Will cleaned b) is cleaning
c) cleans d) clean

17) I plan to take my vacation ___in June______ July — B
a) Whether/or b) either/or
c) as it d) if as

18) _____ many times every winter in Skardu. — A
a) It snows b) it showed
c) it is snowing d) it is snow

19) Work hard_________ you should fail — B
a) Or b) lest
c) that d) none of the above

20) Citizens are _______ stricter immigration laws. — C
a) Asking for b) recommending
c) demanding d) none of the above

21) Nadia doesn't like to drive, ______ she takes the bus everywhere — C
a) But b) yet
c) so d) if

22) She insisted ________ helping me with the dishes — A
a) On b) with
c) for d) about

23) A large sum of money _____ stolen. — B
a) Were b) was
c) have d) had

24) Think not of it — B
[Choose the correct passive voice]
a) It should not be thought.
b) Let it not be thought of.
c) It must not be thought.
d) Let not be think of it-

25) We are very excited _______ our trip to Karachi next week — C
a) At b) with
c) about d) over

26) Choose the word opposite in meaning to "RETAIN" — D
a) Reject b) spare
c) renounce d) eject

27) I am looking forward ______ having meeting with you next week — C
a) With b) at
c) to d) from

28) Choose the correct sentence — C
a) She is busy at the work and won't be home before 10:30
b) She is busy at work and would not be home before 10:30
c) She is busy at work and won't be home before 10:30
d) She is busy in work and would not be home before 10:30

29) Choose the word nearest in meaning to "DEPLETE" — C
a) Destroy b) finish
c) exhaust d) vanish

30) He is quite deaf ____ my requests — C
a) With b) about
c) to d) of

31) He said to me, how long will you stay here?" — C
[Choose the correct indirect speech
a) He said to me how long I would stay here
b) He asked me how long I will stay here
c) He asked me how long I would stay there.
d) He inquired for how long I will stay there.

32) The leader, as well as his brothers,____ to the same tribe — B
a) Belonging b) belongs
c) belong d) belonged

33) instead of beating _____the brush, straightaway come to the point — C
a) Away b) out
c) about d) on

34) passengers _______ to smoke in the train — D
a) Was not allowed b) had not allowed
c) will not allow d) are not allowed

35) Can you _____ a few lines from wordsworth to prove that he is a poet of nature? — D
a) Side b) site
c) site d) cite

VOCABLARY:

1. 'CHUCKLE' means: 2014-04 Med
A) Bouquet of flowers B) Displeasing manner C) Suppressed laughter D) Religious movement

2. 'Money Grubbing' implies: 2014-15 Med
A) Money saving B) Money making C) Money hunting D) Money spending

3. 'Get into a soup' implies: 2014-26 Med
A) Face a predicament B) play a game of cards
C) Swallow a fly in soup D) go for hot spicy soup

4. 'ARABLE' means: 2014-56 Med
A) Not grown since long B) Recently ploughed field
C) Watered the night before D) Fit for cultivation

5. 'ACQUAINTANCE' means a person whom: 2014-93Med
A) One loves but whom one cannot marry. B) One knows but who is not a close friend.
C) One can depend on for help in hour of need. D) One can hire for attempting a question paper.

6. 'APPRAISE' means: 2014-140, 2013-100 Med
A) Praise a man out of place. B) Tell a story at bed time.
C) Evaluate the equality of D) Do shopping in a bazar

7. 'Mortal stay' implies: 2014-152Med
A) Life that a man will have after death. B) Life spent in the company of friend.
C) Life passed in hostel without studying. D) Life in this world which is short lived.

8. 'Break the ice' implies: 2014-171, 2013-160 Med
A) Walk on ice-sheet B) Swallow ice-cube C) Chisel an ice-block D)to make beginning

9. The committee dissented from the report's conclusions. The underlined word means: 2014-128 Med
A) Differed B) Joined C) Deliberated D) Agreed

10. An 'elegy' is a poem written: 2014-182, 2013-140 Med
A) In the memory of little child B) On the death of someone dear.
C) On the sighting of an old tutor D) In the love of dear sweetheart.

11. 'Commencement' means: 2014-20 Eng
(a) The beginning (b) The conclusion (c) The impending (d) The interloping

12. Aboriginal means: 2014-10 Eng
a) Alley b) Native c) Migrate d) Displaced

13. 'Endowed' means: 2014-30 Eng;
(a) Checked or corrected (b) Betrayed or decived (c) Alarmed or disturbed (d)Awarded or gifted

14. 'Archive' means: 2014-40 Eng;
(a) A model of building behind museum. (b) A sequential statement of inventions.
(c) A collection of record about the past. (d) A chronological order of discoveries.

15. 'Incipient' means; 2014-50 Eng;
(a) In coma due to accidental injury (b) Just starting to be or happening.
(c) The recipient of gallantry award. (d) Practitioner of domestic recipes.

16. Blot and smudges implies: 2014-150 Eng
(a) Spot of ink and dirty marks (b) Foul smelling polluted water
(c) Bracelet and bangles of gold (d) Beautiful neat way of writing.

17. 'Get hold or oneself' implies: 2014-160 Eng
(a) To feel exhausted (b) To start running (c) To catch a chief (d) To become calm

18. 'No Wonder' implies: 2014-170 Eng
(a) Not surprising (b) Traffic mishap (c) Nothing weird (d) Seeing strange

19. Some government officials have an irritating Habit of *throwing their weight around everywhere.*
The italicized idiom means: 2014-80 Eng
(a)To redress public grievances. (b)To deliver satisfactory services.
(c)To use power and influence. (d)To Avail facilities.

20. The part of the newspaper in which letters to the editor are published is generally called the agory column.
The underlined word most nearly means: 2014-70 Eng;
(a) Hilarious jokes (b) aggregated problems (c) Intense excitement (d) acute pain

21. Mr. Feroz would rop the dull and wayward students across the knuckles. The Italicized idiom means; 2014-60 Eng;
(a) Reprove (b) Scold (c) admire (d) amuse

22. 'ALLUSION' means: 2013-40 Med
(a) An idea haunting one's mind (b) A casual or indirect reference
(c) Have a low frequency (d) Do not affect a photographic plate

23. GET HOLD OF ONESELF Implies: 2013-50 Med
A) To start running B) To catch a thief C) To become calm D) To feel exhausted

24. In a composition writing exercise, 'PRECISE' means: 2013-70 Med
A) A synopsis for writing an essay in a degree level examination
B) A critique highlighting the weak point of a feature film story
C) A resume of the commercial achievements spread over a year
D) A short summary of the crucial ideas of a longer composition.

25. 'CRANKY SPOUSE' implies: 2013-120 Med,2015-111 Eng
A)A carefully selected loving partner of life B)Fussy and bad-tempered wife or husband
C)Money squandering younger second wife D)A device fitted behind the rear seat of a car.

26. 'DENOUNCE' means: 2013-180 Med
A) To reject straight away B)To praise in a meeting C) To condemn publicly D)To negoticate secretly

27. ALL BY ONESELF' implies: 2013-11 Eng
A) keeping aloof not joining anybody's companyB) in company and all those present join in ghands
C) passing one's life singly like a chronic bachelor
D) completely alone with no help from someone else

28. 'INNUMERABLE' means: 2013-31 Eng

A) In equal numbers B) Numerically scant C) Not in a formation D) Too many to count

29. 'PRECISE' is a short summary of the essential ideas of: 2013-91Eng
A) A mixture of passages B) The underlying them C) The overview practice
D)A longer composition

30. COME OF AGE' implies: 2013-101Eng
A)To get married off B)To become very old C)To reach maturity D)To fall ll and expire

31. 'ENTOURAGE' means: 2013-161 Eng
A) Group of companions B) Embark on long tons C) Place one visits daily D)Albums of folk singer

32. 'HAVE CLEAN HANDS' implies: 2013-191 Eng
A) Wash one's hands B) Go for corruption C) Not being guilty D) Prepare for prayers

33. 'Hue and cry' means a: 2012-58 Eng
(a) colorful cooking (b) shouting at the people (c) Noisy public protest (d) Loud confused talking

34. 'Be poles apart' means 2012-107 Eng 2015-70 Med
(a) either of the two poles (b) have nothing in common (c) leading position in a race (d) affect somebody greatly

35. 'Frown on somebody' means to: 2012- 124 Eng,2015-200 Med
(a) Fall flate upon a stranger (b) Stay alive working hard (c) Disapprove of somebody (d) Unable to be successful

36. 'Cynic' and '_______' are synonyms . 2011-141 Med
(a) skeptic (b) secret (c) solitary (d) truthful

37. A good business man should not be unscrupulouswhile making profits the underlined word means: 2011-131 MED
(a) unprincipled (b) careless (c) illegal (d) miserly

38. Sabiha's dress fits her like a glove. The underlined phrase means: 2011-40 Eng
(a) is too big (b) is too short (c) fits her very well (d)is very comfortable

39. Many People don't want their dirty linen washed in public The underline phrase means: 2011-50Eng
(a) To have their dirty clothes drying on clothes line
(b) To have their private affairs talked about in public
c. to speak about and criticize something in public d. to ask the public to help with a noble cause

40. "MISOGYNIST" most nearly means A person who: 2011-90 Eng
(a) misses his shots (b) hates marriage (c) is against hunting (d) is left out of a sporting team

41. "CEMETERY" most nearly means: 2011-130 Eng
(a) graveyard (b) factory (c) system (d) pattern

42, 'ABORGINAL' most nearly means: 2011-180 Eng
(a) unoriginal (b) native (c) cheap (d) second rate

43. There is no dearth of talent in our country. The underlined word means: 2011-190Eng
(a) training (b) shortcoming (c) encouragement (d) shortage

44. Their hospitality is proverbial. The underlined word means; 2011-200Eng
(a) sensible (b) well-known (c) exceptional (d) matchless

45. MAKESHIFT is closest in meaning to: 2010-07 Med
a. Impulsive b.Revolving c. Substitute d. Practical

46. FORESHADOW is closest in meaning to; 2010-33 Med
a. Dread b. Disguise c. Endanger d. Indicate

47. To have an old head on young shoulders means: 2010-123 Med
a)To be wiser than one's age b)To be young but appear old
c)To have ache in the shoulders d)To be old but appear young

48. BRILLIANT is closest in meaning to: 2010-41 Eng
a. Sparklin b. Glorious c. Talented d. Showy

49. INVALUABALE is closest in meaning to: 2009-20 Med
a. External valuable b. Worthless c. Highly expensive d. Fertile

50. 'FORGO' is closest in meaning to: 2009-110Med
a. run away b. Do without c. Safeguard d. Precede

51. The word GAUNT means: 2008-92 Med
a. ill health b. glove c. slout d. gravel

52. To have a windfall refers to: 2008-85 Med
a. Bad weather b. receiving gifts c. receiving profits d. sudden calamity

53. The word REPROACH means: 2008-90Med
a. Approach again b. reach again c. blame d. praise

54. The word PROSCRIBE means : 2008-101 Med
a. say with authority b. unwanted behavior c. denounce d. supporting teacher

55. To burn the Candle at both ends refers to: 2008-105 Med
a. Hard work b. face great loss c. face challenge d. waste money

56. The word LEVITY means; 2008-109 Med
a. Impose one's viewpoint b. serious attitude c. Non-serious attitude d. Enjoy frequent leave

57. The word INCENSE means: 2008-130 Med
a. Make angry b. Alert c. fool ill d. encourage

58. The word PRODIGAL means. 2008-135 Med
a. careful with money b. wasteful with money c. wonderful d. helpful to people

59. The word PREDILECTION means: 2008-184 Med
a. preference b. prediction c. reverence d. induction

60. Our plays have been very capricious in their performance. The underlined word means ;2007-42 Med
a. Wonderful b. Unpredictable c. Adventurous d. Tricky

61. Homicide 2007-68 Med
a. Is a poison b. Means killing members of one's species
c. Means murder d. Means the murderer of one's own family

62. Autocracy is the government of. 2007-97 Med
a. One person with absolute power b. Lawyers fraternity
c. Elected representatives of the masses d. Intelligentsia

63. The bottom line is that we cannot ignore the cultural aspect in education. The underlined expression means. 2007-100 Med
a. Most important thing b. The last line in an essay c. Conclusion d. Trend

64. The word SEISMOLOGY stands for. 2007-113 Med
a. An instrument for detecting earthquakes b. Study of sea creatures
c. A branch of astrology d. Scientific study if earthquakes

65. 'Browned off 'means: 2006-06 Med
a. grilled properly b. bored c. discouraged d. cleaned

66. 'Blow great trumpet / horn 'refers to: 2006-30 Med
a. boast b. violent flow of winds c. celebrate enthusiastically d. eruption of war

67. A man of letters is; 2005-149 Med
a. A postman b. A person who is fond of writing letters
c. A man well versed in literature d. A man who writes letters for others

68. Choose the word closest in meaning to the word GENOCIDE; 2005-180 Med
a. Self destruction b. Murder of a father c. Murder of a kin d. killing an entire race

69. He extolled the virtues of the Russian people. [The underlined word means:] 2015-10 Med
A) Admired B) Praised C) Censured D) Adopted

70. The local inns are bursting at the seams and may not be able to accommodate anymore. [The underlined phrase means]: 2015-140 Med
A) Unhygienic B) Overcrowded C) Empty D) Shutting Down

71. 'NEPOTISM' means: 2015-73 Eng
A) Criticism B) Socialism C) Favoritism D) Monotheism

72. She fund too late that her precious art pieces were not worth a dime. The underlined phrase means: 2015-86 Eng
A) In good state B) New C) of little value D) Priceless

73. A pale moon and watery sun are known as prognostics of rain. The underlined word means; 2015-109 Eng
A) Indications B) Start C) Cause D) Friends

74. DAUNTED means: 2015-145 Eng
A) Intimidate B) Speculate C) Emancipate D) Evacuate

75. Choose the word most similar in meaning to the capitalized word "REVILE": 2016-190 Eng
(a) Perceive (b) Pawn **(c) Abuse** (d) Prevent

76. "Be Poles apart" means: 2016-170 Eng
(a) Either of the two poles
(b) Having nothing in common
(c) Leading position in a race
(d) Affect somebody greatly

77. Choose the word most similar in meaning to the capitalized word "VESTIGE": 2016-140 Eng
(a) Servile (b) Embark (c) Hunch **(d) Indication**

78. Chose the word most similar in meaning to the capitalized word "IGNOMINY": 2016-120 Eng
(a) Dishonor (b) Enthusiasm (c) Besiege (d) Contrary

79) Choose the word opposite in meaning to the capitalized word ANARCHIC: 2016-143 Med
(a) Riotous (b) Turbulent (c) Disordered (d) Organized

80) Frown on somebody means to: 2016-151 Med
(a) Fall flat upon a stranger (b) Stay alive working hard
(c) Unable to be successful (d) Disapprove of somebody

81) Choose the word most similar in meaning to the capitalized word "PRODIGIOUS": 2016-166 Med
(a) Enormous (b) Sacred (c) Seismic (d) Tiny

82) Choose the word most similar in meaning to the capitalized word "OBLITERATE": 2016-67 Med
(a) Offend (b) Haul
(c) Rent (d) Destroy

83) That a driver swerves in order to avoid an accident can be proven by examining the marks on the pavements. 2017-150 Med
(The underlined word nearly means)
A.Stops quickly B.Turns sharply C.Hits something else D.Goes backward

84) Choose the synonym for the word "ABRIDGE" 2017165 Med
A. To make a bridge B.Shorten
C. Magnify D.Divert

85. It is a general perception that doctors have a callous disregard for feeling of others;
(The underlined word nearly means) 2017176 Med
A.Respectable B.Careful C.Unfeeling D.Sensitive

86) A thrifty buyer purchases fruits and vegetables in season. 2017198 Med
(The under lined word nearly means)
a.Careful B. Professional c. Disinterested D. Healthy

Answer Key:

1. C) Suppressed laughter
2. B) Money making
3. A) Face a predicament
4. D) Fit for cultivation
5. B) One knows but who is not a close friend.
6. C) Evaluate the equality of
7. D) Life in this world which is short lived.
8. D)to make beginning
9. A) Differed
10. B) On the death of someone dear
11. (a) The beginning
12. b) Native
13. (d)Awarded or gifted
14. (c) A collection of record about the past
15(b) Just starting to be or happening.
16. (a) Spot of ink and dirty marks
17. (d) To become calm 18. (a) Not surprising
19. (c)To use power and influence.
20. (b) aggregated problems
21. (b) Scold
22. (b) A casual or indirect reference
23. C) To become calm
24. D) A short summary of the crucial ideas of a longer composition
25. B)Fussy and bad-tempered wife or husband
26. C) To condemn publicly
27. D) completely alone with no help from someone else
28. D) Too many to count
29. D)A longer composition
30. C)To reach maturity
31. A) Group of companions
32. C) Not being guilty
33. (c) Noisy public protest
34. (b) have nothing in common
35. (c) Disapprove of somebody
36. (a) skeptic
37. (a) unprincipled
38. (c) fits her very well
39. (b) To have their private affairs talked about in public
40. (b) hates marriage
41. (a) graveyard
42. (b) native
43. (d) shortage
44. (b) well-known
45. a. Impulsive
46. d. Indicate
47. a)To be wiser than one's age
48. c. Talented
49. c. Highly expensive
50. b. Do without
51. a. ill health

52. b. receiving gifts
53. c. blame
54. c. denounce
55. d. waste money
56. c. Non-serious attitude
57. a. Make angry
58. b. wasteful with money
59. a. preference
60. b. Unpredictable
61. c. Means murder
62. a. One person with absolute power
63. a. Most important thing
64. a. An instrument for detecting earthquakes
65. c. discouraged
66. a. boast
67. c. A man well versed in literature
68. d. killing an entire race
69.
70. B) Overcrowded
71. C) Favoritism
72. C) of little value
73. A) Indications
74. C) Emancipate
75. **(c) Abuse**
76. **(b) Having nothing in common**
77. **(d) Indication**
78.**(a) Dishonor**
79. D
80.A
81.D
82.
83.B
84.B
85.C
86.A

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Antonyms;

1. AMICABLE is nearly opposite in meaning to; 2007-13 Med
(a) Hostile (b) Indispensable (c) Inimical (d) Amiable

2. 'Professional' and '_______' are antonyms. 2011-151 Med
(a) unemployed (b) entrepreneur (c) amateur (d) capitalist

3. Choose the word opposite in meaning to the capitalized word 'TABGIBLE' [2016]
a)emboided b) conceptual c) phenomenal d) verifiable

4. choose the antonym of the word 'UNTENABLE' [2017]
a)tender b) sheepish c) susupportable d) tremulous

5. choose the antonym from the word; 'ABROGATE' [2017]
A)transgress B) signify C) alleviate D) ratify

Answer Key
1. (a) Hostile
2. (c) amateur
3. **B**
4.C
5.D

Preposition;

1. It has been raining continuously last night. 2015-60 Med
A) Since B) for C) from D) with

2. I insist ______ the withdrawal of your statement. 2015-120 Med
A) for B) on C) at D) in

3. The lady sitting _______ me has an elegant style. 2015-150 Med
A) at B) beside C) about D) around

4. There are ______ fish in this pond. 2015-170 Med
A) Many B) Much C) Any D) More

5. She is very nice to look _____. 2015-44 Eng
A) at B) by C) beside D) on

6. The police are looking___ the recent state of burglaries. 2015-162 Eng
A) into B) to C) at D) for

7. You will be the perfect in charge ____ this group. 2014-47 Med
A) of B) to C) by D) on

8. I eagerly look forward _____ seeing you again 2014-37 Med
A) at B) to C) on D) by

9. The senator is opposed _____ this new legislation. 2014-160 Med

A) at B) to C) try D) on

10. He was arrested and charged _____ murder. 2014-190 Med
A) with B) into C) over D) about

11. ______ second thoughts 1 opted for a cold drink; 2014-197 Med
A) At B) By C) On D) For

12. Add some milk and sugar _____ the afternoon tea. 2014-167 Med , 2013-20 Med
A) with B) in C) on D) to

13. Please help someone the house is ….life. 2013-110 Med
A) At B) In C) On D) By

14. My children don't approve….. my smoking. 2013-150 Med
A) I B) Of C) On D) at

15. Marvin was arrested and charged… murder. 2013-51-Eng
A) Into B) Over C) With D) Near

16. Leagerly-look forward… seeing her again. 2013-131 Eng
A) At B) To C) On D) by

17. The senator is opposed ….. this new legislation. 2013-151Eng
A) To B) At C) By D) on

18. Please come to the point; don't beat __ the bush. 2012-39 Med
A) across B) about C) along D) around

19. She has complained_____ me to the Principal. 2012-46 Med
A) about B) from C) against D) over

20. Allah, the Almighty, has blessed him___ a son. 2012-81 Med
A) by B) along C) from D) with

21. There are ______ fish in this pond. 2012-20 Eng
(a)much (b) any (c) more (d) many

22. I insist _____ the withdrawal of your statement. 2012-99 Eng
(a) for (b) at (c) in (d) on

23. It has been raining continuously ____ last night. 2012-171 Eng
(a) Since (b) For (c) From (d) With

24. She has let _____ her house fully furnished to a Korean couple. 2011-22Med
(a) out (b) at (c) up (d) in

25. When everyone hung _____ the leader picked on the most suitable person to do the job. 2010-63 Med
(a) Out (b) About (c) Back (d) On

26. The thief ran ________ the street to the other side and hid under the bridge. 2010-97 Med
(a) Over (b) Across (c) Along (d) Beside

27. You should not swim __ a meal. 2010-166 Med
(a) After (b) Over (c) About (d) Across

28. The students will go camping ____ the vacations. 2010-17 Eng
(a) At (b) During (c) For (d) In

29. I can't make ___ what he has written. 2010-104 Eng
(a) Out (b) Up (c) After (d) For

30. Have you made ___ your mind about acting in the play? 2010-83 Eng
(a) Out (b) Over (c) Up (d) On

31. Most people are afraid to go ___ the beaten track. 2010-176 Eng
(a) From (b) To (c) off (d) Against

32. When she came ____ senses, she asked to see her son. 2009-140 Med
(a) in (b) to (c) at (d) into

33. The boys got ____ the bus at the terminal. 2009-150 Med
(a) From (b) of (c) off (d) all

34. Which one is a preposition? 2008-116 Med
(a) against (b) loudly (c) so (d) be

35. If you like sport, this is a great place, there is a lot to choose______________ [2016]
a)among b)from c)at d) for

36. I insist__________ the withdrawl of your statement. [2016]
a)for b)on c)at d)in

37. he is grieving__________ his deceased father
    a)at b)for c)on d)over

Answer Key

1. A) Since
2. B) on
3. B) beside
4. A) Many
5. A) at
6. A) into
7. A) of
8. B) to
9. B) to
10. A) with
11. B) By
12. D) to
13. C) On
14. B) Of
15 C) With.
16. B) To
17. A) To
18. B) about
19. C) against
20. D) with
21. (d) many
22. (d) on
23. (a) Since
24. (b) at
25. (b) About
26. (b) Across
27. (a) After
28. (b) During
29. (a) Out
30. (c) Up
31. (c) off
32. (b) to
33. (c) off
34. (a) against
35.B (againsy)
36.B (from)
37.A (AT)

Correct Sentences;

1. Choose the correct sentence: 2015-110 Med
   A) If I knew him better, I would have insisted that he change the hour of the lecture.
   B) If I knew him better, I would have insisted that he changed the hour of the lecture.
   C) If I knew him better, I would insist that have change the hour of the lecture.
   D) knew him better, I would insist for him to change the hour of the lecture.

2. Choose the Correct sentence: 2015-40 Med
   A) He throwed it out the window. B) He threw it out the window.
   C) He thrown it out the window. D) He thrown it out the window.

3. Choose the correct sentence: 2015-180 Med
   A) As far as I know he bears a good moral character. B) So far as I know, he bears a good moral character.
   C) As long as I know, he bears a good moral character. D) Not that I know, he bears a good moral character.

4. Choose the correct sentence; 2015-124 Eng
   A) I am a Pakistani and so is she B) I am, a Pakistani and she is also
   C) she and me are Pakistani D) I am a Pakistani as is she

5. Choose the correct sentence: 2015-174 Eng
   A) One must not boast of his own success. B) One must not boast of her own success.
   C)One must not boast of one's own success. D) One must not boast of ones own success.

6. The correct sentence is; 2015-193 Eng
   A) I came across a friend of yours the pther day B) I came across a friend of yours the other day
   C) I came across a friend of your the other day D) I came across a friend of yours the other day

7. Choose the Correct Sentence: 2014-87Med
   A) The lecture was long a bore and uninspired. B) The lecture was long a bore and uninspiring.
   C) The lecture was long boring and uninspiring D) The lecture awas a long a bore and an uninspiring.

8. Choose the correct sentence. 2014-72 Med
   A) We bought some new clothing. B) We bought some new clothings.
   C) We bought some new piece of clothings D) We bought some new pieces of clothings.

9. Select the correct sentence: 2014-180 Eng
   A) She possesses some small charming silver ornaments.
   B) She possesses some charming smal silver ornaments.
   C) Some charming small silver ornaments she possesses.
   D) Some small silver charming ornaments the possesses.

9. Select the correct sentence: 2014-190 Eng
   A) Across the rooftop the thief silently crept. B) The rooftop across silentlycrept the thief.
   C) Thief crept silently across the rooftop. D) Silently the thief crept across the rooftop.

10. Select the correct sentence: 2014-200 Eng;
A) The best person cartainly she is for the job. B) Certainly she is the best person for the job.
C) She is the best person for the job certainly. D) She is certainly the best person for the job.

11. Some one is walking behind us. I think: 2014-100 Eng;
(a) We are being followed (b) We have been followed.
(c)We are followed. (d) We were being followed.

12. Select the correct sentence: 2013-60 Med
A) My feet seemed hardly to touch the earth. B) My feet hardly seamed to touch the earth.
C) Hardly my feet seemed to touch the earth. D) My feet seemed to touch the earth hardly.

13. Fire destroyed the top floor of the building: 2013-90 Med
A) The top floor of building got destroyed by fire. B) By fire was destroyed top floor of the building.
C) Destroyed by fire was the top floor of the building. D) The top floor of building was destroyed by fire.

14. Select the correct sentence: 2013-130 Med
A) Farid and javed both are good swimmers. B) Both farid and javed are good swimmers.
C) Good swimmers are Farid and faved both. D) Swimmers are good both Farid and faved.

15. Select the correct sentence: 2013-170 Med
A) Certainly she is the best person for the job. B) She is the best person for the job certainly.
C) She is certainly the best person for the job.D) The best person certainly she is for the job.

16. Select the correct sentence: 2013-41 Eng
A) Last night we watched a barbaric movie. B) Last night we watched a turmeric movie.
C) Last night we watched a agnostic movie. D) Last night we watched a fantastic movie.

17. Select the correct sentence: 2013-71 Eng
A) She possesses some small charming silver ornaments.
B) Some charming small silver ornaments she possesses.
C) Some small silver charming ornaments she possesses.
D) She possesses some charming small silver ornaments.

18. Select the correct sentence: 2013-141 Eng
A)But brightly polished were the old shoes. B) Old were the shoes but brightly polished
C)The shoes were old but polished brightly. D) The shoes were old but brightly polished

19. When you go to Karachi, please; 2012-06Med
A) Collect a good watch for me B) Acquire a good watch for me.
C) Bring a good watch for me. D) Arrange a good watch for me.

20. Choose the correct sentence out of the following:- 2012-25 Med
A) The country was hard hit by the war. B) The country was hardly hit by the war.
C) The country was severely hit by the war D) The country was more hardly hit by the war.

21. If you want to play cricket,…….. 2012-79 Med
A) you ought to join our club. B) you ought to join with our club.
C) you ought joined our club. D) you ought to join in our club.

22. They arrived at about mid night; 2012-192 Med
A) because their flight was detained. B) because their flight was delayed.
C) because their flight was derailed. D) because their flight was diverted.

23. As you have not prepared your work ___ 2012-10 Eng
a) you may not fall in the examination b) you could prepare harder next time
c) you would do better in the examination d) you are not likely to do well this time.

24. Do you go shopping often? Yes, ____ 2012-40 Eng
(a) I go shopping on Mondays (b) I go shopping once a week
(c) I go shopping every days (d) I go shopping at Super Market.

25. Choose the correct sentence of the following : 2012-46 Eng
(a) I am much thankful to you. (b) I am quite thankful to you
(c) I am just thankful to you (d) I am very thankful to you

26. Choose the correct sentence out of the following: 2012-85 Eng
(a) every one of the two students got a prize. (b) any one of the two students got a prize.
(c) each of the two students got a prize. (d) each one of the two students got a prize.

27. Choose the correct sentence out of the following: 2012-197 Eng
(a) As far as I know he bears good moral character (b) As long as I know, he bears good moral character
(c) So far as I know, he bears good moral character (d) Not that I know, he bears good moral character

28. Don't worry what other people think ………. 2011-70 Eng
(a) just take not note of them (b) just take no sign of them
(c) just take not hint of them (d) just take no notice of them

29. You can't agree with both of them …….. 2011-60 Eng
(a) make your opinion up (b) make your mind up (c) make brain up (d) make up your mind

30. Driving to work, 2011-100 Eng
(a) he saw many children going to school (b) the traffic made him late
(c) the traffic jams infuriated him (d) his car broke down many times

31. Running into room, 2011-120 Eng
(a) a rug caught her foot and she fell (b) she caught her foot on a rug and she fell
(c) her foot was caught on a rug and she fell (d) she had fallen after catching her foot on a rug.

32. As soon as he reached home, he realized that he had lost a five ; 2007-140 Med
a)Thousands rupees note b) Thousands rupees' note c)Thousand rupees note d)Thousand rupee note
Choose the correct sentence. 2016-30 Eng
(a) I got outside and looked in at the field (b) I went outside and look out at the field.
(c) I went outside and looking out in the field **(d) I went outside and looked out at the field**

33. Choose the correct sentence 2016-100 Eng
(a) My father is thinking that I should stop smoking
(b) My father thinks I should stop smoking
(c) My father through I should stop smoking
(d) My father think I should stop smoking

34. Choose the correct sentence 2016-110 Eng
(a) He probably isn't going to come to school tomorrow.
(b) He probably doesn't go to school tomorrow
(c) He probably isn't go to come to school tomorrow
(d) He probably won't come to school tomorrow

35. Choose the correct sentence; 2016-160 Eng
(a) I am much thankful to you (b) I am quite thankful to you
(c) I am just thankful to you **(d) I am very thankful to you**

36. Choose the correct sentence. 2016-60
(a) With the vial set inside the fly box, all the flies could be put to sleep within seconds.
(b) With the vial settled inside the fly box, all the flies could be put to sleep within seconds.
(c) With the vial set inside the fly box, all the flies could be putting to sleep within seconds.
(d) With the vial set inside the fly box, all the fly could be put to sleep in seconds.

37. Choose the correct sentence. 2016-07 Med
(a) Each contained a different specie of insect.
(b) Each contained a different species of insect.
(c) Each contained a different species of insects.
(d) Each contained a different species of insect.

38. Choose the correct sentence. 2016-12 Med
(a) He can speak Japanese because he was born in Canada.
(b) He can speak Japanese until he was born in Canada.
(c) He can speak Japanese even though he was born in Canada.
(d) He can speak Japanese so he was born in Canada.

39. Choose the correct sentence 2016- Med
(A) Tom left by the crossroads when you reachit
(b) Tum lent by the crossroads until you reach
(c) Turn left with the crossroads when you reach it
(d) Tum left at the crossroads when you reach it

40. Choose the correct sentence. 2017-20 Med
A) Naila was exhausted that on she laid down for a nap
B) Naila was so exhausted that on she laid down for a nap
C) Naila was so exhausted that on she was lying down for a nap
D) Naiia' was so exhausted that on she will lay down for a nap

41. Choose the correct sentence 2017-42 Med
A.How long your wearing glasses?
B. How long do you wear the glasse?

C.How long you wear glasses ?
D. How long have you been wearing glasses?

42. Choose the correct sentence. 2017-57 Med
A. The village folk were present. B. The village folk was present.
C. The village folks were present. D. The village folks was present.

43. Which of the following is correct in all respects? 2018155 Med,Paper-D
A)I have done matric in 2010 B)This is an utensil.
C)The population of the world rises D.This is the best peach producing valley

Answer Key

1. **B)** If I knew him better, I would have insisted that he changed the hour of the lecture.
2. B) He threw it out the window.
3. A) As far as I know he bears a good moral character.
4. A) I am a Pakistani and so is she
5. C)One must not boast of one's own success.
6. A) I came across a friend of yours the pther day
7. C) The lecture was long boring and uninspiring
8. A) We bought some new clothing.
9. C) Thief crept silently across the rooftop
10. B) Certainly she is the best person for the job
11. (a) We are being followed
12. B) My feet hardly seamed to touch the earth
13. D) The top floor of building was destroyed by fire
14. B) Both farid and javed are good swimmers.
15. A) Certainly she is the best person for the job
16. D) Last night we watched a fantastic mo
17. D) She possesses some charming small silver ornaments.
18. D) The shoes were old but brightly polished
19. C) Bring a good watch for me
20. C) The country was severely hit by the war
21. A) you ought to join our club
22. B) because their flight was delayed
23. d) you are not likely to do well this time
24. (b) I go shopping once a week
25. (d) I am very thankful to you
26. (c) each of the two students got a prize
27.
28. (d) just take no notice of them
29. (d) make up your mind
30. (a) he saw many children going to school
31. (d) she had fallen after catching her foot on a rug
32.. **(d)** I went outside and looked out at the field
33. (b) My father thinks I should stop smoking.
34. (d) He probably won't come to school tomorrow.
35. (d) I am very thankful to you
36.a. (a) With the vial set inside the fly box, all the flies could be put to sleep within seconds.
37. B
38.C
39.D
40.C
41.D
42.A
43.D

Fill in the Blanks;

1. He was ________ in bed all day yesterday. 2015-20 Med
A) Laying B) Lying C) Lieing D) Lied

2. The rising price of electricity has ________ affected the less fortunate. 2015-80 Med
A) Positively B) Not C) Adversely D) Slowly

3. Your friend proved more sympathetic than I expected he ________ do. 2015-100 Med,2012-191 Eng
A) will B) Shall C) would D) should

4. You _____ have told me the sad news earlier. 2015-11 Eng
A) Would B) Must C) Should D) Ought

5. Student's ______ submit their assignments in time or they will be marked absent. 2015-21 Eng
A) Would B) Shall C) Must D) May

6. If you had _______ her on the matter, you would not have made this blunder. 2015-77 Eng
A) Advised B) Consulted C) Discussed D) Referred

7. A _____ child, she was soon bored in class; she already knew more mathematics than her junior school teachers. 2014-76;Med
A) Contemporary B) Lethargic C) Obdurate D) Precocious

8. The boys loved the zoo. They ______ wild: 2014-90 Eng;
(a) have never seen (b) never saw (c) had never seen (d) All are correct

9. In Pakistan, the more electricity you use, ____ you bill will be: 2014-110 Eng

(a) The more high (b) The more highly (c) The highest (d) The higher

10. The flat be alright. If the people above us ____ not so noisy ; 2014-130 Eng
(a) are (b) would be (c) were (d) will be

11. I shall see you tomorrow ____ I have to work late _____ 2014-140Eng
(a) in case (b) unless (c) if (d) as

12. In grammatical context, 'ARTICLES' allude to: 2013-181Eng
A) A, an and the B) For and since C) Lexical verbs D) Word classes

13. Mathematics …. difficult but is fascinating. 2012-35 Med
A) seems B) is seeming C) seemed D) seem

14. You need to go to the hospital _____ possible. An erratic heart-beat can be very dangerous. 2012-91 Med
A) as good as B) as long as C) as much as D) as soon as

15. Ghani Khan is______ of Pashto. 2012-120 Med
A) John Keats B) a John Keat C) the John Keats D) like John Keats

16. If it did not rain in time, there ___ a horrible famine. 2012-163Med
A) would have been B) will be C) would be D) will have been

17. They should have arrived by now_______ I wonder: 2012-143 Eng
(a) what has kept them (b) what has got them (c) what has held them (d) what has done them

18. Your friend proved more sympathetic than expected he do. 2012-191 Eng
(a) will (b) Shall (c) should (d) would

19. We need ______ guidelines to start with. 2011-01 Med
(a) a few (b) any (c) little (d) some

20. Which one would you class it as more We need ______ guidelines to start with. 2011-06Med
(a) few (b) any (c) little (d) some

21. The authorities have _______ that the plane to Beirutwas hijacked over the Indian ocean. 2011-12Med
(a) assured (b) confirmed (c) committed (d) ensured

22. Your ________ too long: you had better go to the hairdresser today. 2011-42 Med
(a) hair is (b) hair are (c) hairs are (d) hairs is

23. I have no ______ to listen to the budget speech. 2011-32Med
(a) trouble (b) convenience (c) patience (d) perseverance

24. You can always count on me. I will not let you_____________ 2011-52 Med
(a) alone (b) down (c) off (d) through

25. She ______ her parents. They must be worried about her health. 2011-72 Med
(a) had better call (b) had better called (c) had better to call (d) better call

26. Styles _______ popular in the 1960s are reappearing in high fashion boutiques. 2011-62 Med
(a) what have been (b) which have been (c) that have been (d) that were

27. Styles _______ popular in the 1960s are reappearing in high fashion boutiques. 2011-82 Med
(a) what have been (b) which have been (c) that have been (d) that were

28. She ______ her parents. They must be worried about her health. 2011-94Med
(a) had better call (b) had better called (c) had better to call (d) better call

29. He _______ before the interview board. 2011-101Med
(a) was afraid to appear (b) was afraid of appearing
(c) was afraid of appearing (d) feared appearance

30. _________ in the world. 2011-121 Med
(a) our's is not one of the quickest response system (b) our is not one of the quickest response systems
(c) Ours is not one of the quickest response systems(d) our is not one of the quickest response system

31. Secrets leak when the ______ are many. 2011-161 Med
(a) Enemies (b) ill-whishers (c) confidants (d) detractors

32. The guard looked at me _____ and then asked me to identify myself. 2011-171 Med
(a) Dangerously (b) hurriedly (c) suspiciously (d) nervously

33. Her ______ lasted for one month. They were the longest wedding celebrations in that area. 2011-191 Med
(a) Rituals (b) matrimonial (c) nuptials (d) rites

34. She tried to _____ my question, but I persisted in having an answer. 2011-181 Med
(a) Refrain (b) evade (c) refuse (d) deny

35. Most people like the ___of not having to work. 2011-20 Eng

(a) Scheme (b) suggestion (c) design (d) idea

36. Many people have _______ about winning a big prize in the lottery. 2011-10 Eng
(a) Imagined (b) visuallized (c) fantasized (d) discovered

37. When I told him about it, he ……… 2011-30 Eng
(a) Is just laughing (b) has just laughed (c) was just laughing (d) just laughed

38. I don't like pasta and my sister doesn't ……. 2011-80 Eng
(a) too (b) neither (c) either (d) also

39. The president ____ on TV tonight. 2011-110 Eng
(a) speaks (b) will speak (c) has spoken (d) is speaking

40. More than one student ________ absent the day before yesterday. 2011-140 Eng
(a) was (b) were (c) had been (d) have been

41. 'Moon' is to 'Satellite' as 'Earth' is to_______ 2011-160 Eng
(a) solar system (b) sun (c) planet (d) asteroid

42. Only after my wife asked me the time _______ that I had lost my watch. 2011-150 Eng
(a) did I realized (b) I realized (c) I did realized (d) I did realize

43. "Influenza" is to "Virus" as 'Typhoid' is to__________ 2011-170Eng
(a) bacteria (b) bacillus (c) parasites (d) protozoa

44. Mother is __________ the baby dinner in the kitchen. 2010-05 Med
a. Preparing b. Prepared c. Preparation d. Preparatory

45. We were moved ___________ the cat struggling to live her kitten. 2010-17 Med
a. See b. Saw c. To have seen d. To see

46. A ____________ is a person who is dissatisfied and inclined to rebel. 2010-39 Med
a. Delinquent b. Revolutionary c. Pessimist d. Non conformist

47. Rashid spoke ____ that he was praised by all the debaters. 2010-92 Med
a. Well b. As well c. Very well d. So well

48. He is rather an ___ teacher he never accepts the students excuses. 2010-109 Med
a. Incredulous b. Unbelievable c. Interesting d. Indiscriminate

49. Do you have ___ difficulty with the language? 2010-138 Med
a. Any b. Some c. Every d. Many

50. Here are your shoes,I ____ them . 2010-145 Med
a. Just clean b. Just cleaned c. Have just cleaned d. Have just cleaned

51. The actress traveled ____ to avoid being recognized by her fans. 2010-160Med
a. Unknown b. Concealed c. Incognito d. Anonymously

52. The stranger ___ the little girl with some sweets. 2010-150 Med
a. Deceived b. Attracted c. Enticed d. Praised

53. The military coup in the country brought an end to ___ rule by the emperor. 2010-192 Med
a. Omnipotent b. Almighty c. Dictatorial d. Monopolistic

54. He has ___ his pen and is buying another one. 2010-180 Med
a. Lose b. Lost c. Loser d. Loss

55. A constellation is made up of stars a troupe is made up of: 2010-103Med
a. Starlets b. Speakers c. Actors d. Beggars

56. She wears sun glasses to ___ her eyes from the harmful rays of the sun. 2010-02 Eng
a. Prevent b. Protect c. Defend d. Shelter

57. The noisy behavior of the children ___ their teacher. 2010-08 Eng
a. Aggrieved b. Impeached c. Tempered d. Incensed

58. The librarian can provide you a/an ___ edition of the book. 2010-33 Eng
a. Abridged b. Summarized c. Abbreviated d. Shortened

59. We are eager ___ the scientist . 2010-67 Eng
a. To meet b. Meet c. To have met d. Meeting

60. ___ property was damaged by the typhoon. 2010-55 Eng
a. Many b. Much c. More d. Several

61. The building was completely ___ by the fire. 2010-77 Eng
a. Obliternated b. Demolished c. Annihilated d. Destroyed

62. There are many __ organization here which need voluntary workers. 2010-87 Eng

a. Sympathetic b. Charitable c. Generous d. Sociable

63. I am much obliged to you for your ____ assistance. 2010-114 Eng
a. Valuable b. Value c. Valuation d. Valueless

64. The young officer was __ because of his excellent performance. 2010-122 Eng
a. Raised b. Progressed c. Improved d. Promoted

65. They heard the sirens ___ as the fire engines approached: 2010-126 Eng
a. To will b. Wail **c.** Willed d. Willing

66. Sarwar ___ collect antiques but now he has other pastimes. 2010-136 Eng
a. Used to b. Was used to c. Used to be d. Using to

67. There is sufficient ___to charge the man with fraud: 2010-157 Eng
a. Data b. Information c. Evidence d. Clue

68. Mr. Alif Din is a/an ___ figure in the political scandal. 2010-165 Eng
a. Prominent b. Outstanding c. Conspicuous d. Remarkable

69. The championship games is on this weekend ___ I am feeling a little nervous: 2010-172 Eng
a. since b. But c. Although d. And

70. He has ___ his pen and is buying another one. 2010-180 Eng
a. Lose b. Lost c. Loser d. Loss

71. The military coup in the county has brought an end to ___ rule by the emperor. 2010-192 Eng
a. Tyrant b. democratic rule c. Eclipse d. Lasting

72. It is useless _______ them; they are sure to have left the house by now. 2009-10 Med
a. to call b. Call c. Called d. calling

73. If you had passed your examination we______ a celebration: 2009-39Med
a. Would have had b. Must have c. would have d. Will have

Hints: Conditional Sentences:

- If clause is Present Indefinite than reward clause will be in Future Indefinite.
- If clause is Past Indefinite than reward clause will be "Would"
- If clause is Past Perfect than reward clause will be "Would have"

74. Tell him not _____ anyone enter the enclosure . 2009-40 Med
a. To let b. Let c. to have let d. Telling

75. When I got up yesterday, the ground was wet it__________: 2009-50 Med
a. Has rained b. Was rained c. had rained d. Rained

76. He reads ___ magazine he can lay his hands on: 2009-60Med
a. Some b. Every c. The d. Any

77. When the man failed to answer where ___ the police became suspicious: 2009-70Med
a. did he belong to b. was he belonging to **c.** he belonged to d. he was belonging to

78. A train is ___ different bogeys. 2009-80Med
a. Made of b. Make up of c. Made with d. made up of

79. They had a quarreled about their holiday destination. The underlined word is: 2009-90 Med
a. an adverb b. an adjective c. an auxiliary d. a pronoun

80. We waited ____ dark. 2009-100 Med
a. beyond b. before c. until d. unless

81. A fool and his ______ are soon parted: 2009-120 Med
a. Family b. Friends c. Riches d. Money

82. I've hung out the clothes. It's lovely and sunny: if it …… like this they …. Dry in two hours: 2009-130Med
a. Stayed would be b. Stays, will be c. Had stayed, would have been d. will stay, will be

83. My stay in Gilgit will remain ____ fond memory to me. 2009-169 Med
a. a b. the c. my d. any

84. The students were ____ and the teacher, therefore did not take the class. 2008-01Med
a. Only few b. a few c. no much d. few

85. Many ancient civilizations _______ on the banks of major rivers. 2008-39 Med
a. dashed b. Flourished c. Sprawled d. Succeeded

86. The managing director _____ staff to work hard with a promise of high salary: 2008-125 Med
a. motivates b. mitigates c. maneuvers d. minces

87. She was ____ of the result of the interview which she attended. 2008-140Med

a. reluctant b. apprehensive c. pervasive d. bounced

88. Which one is an interjection? 2008-179 Med
a. How b. Hurrah c. Go d. Otherwise

89. His driving is rather ___. He moves smoothly and then all of a sudden becomes negligent; 2007-24 Med
a. Careless b. Erratic c. Relentless d. Carefree

90. Most people think _____ is an essential feature of modern life ; 2007-33 MED
a. The television b. A television c. The TV d. Television

91. Going to ______ is considered vulgar by the elders of our village. 2007-52 Med
a. The cinema b. Cinema c. A cinema d. Cinemas

92. The air we _____ today has many harmful elements in it ; 2007-64 Med
a. Breathe b. Are breathing c. Breath d. Have breathed

93. She dresses with great _________ and that is how she impresses people ; 2007-72 Med
a. Pride b. Otrageousness c. Ostentation d. Pancche

94. It is very difficult to relax while working with their new boss because he is a hard; 2007-82 Med
a. Worker b. Hearted c. Taskmaster d. Nut to crack

95. The building with numerous arches looked ______ in the moonlight; 2007-156 Med
a. Brightly b. splendidly c. Mysteriously d. Magnificent

96. The man sitting next to me on the plane was nervous because he _________ before;2007-199 Med
a. Had not flown b. Did not fly c. Has not flown d. Has not been flying

97. Many ancient civilizations ____ on the banks of major rivers. 2006-39 Med
a. dashed b. flourished c. sprawled d. succeeded

98. Which one is an auxiliary? 2006-58 Med
a. Did b. at c. on d. by

99. His fondness for ______ makes his writings difficult to understand because most readers don't know the newly invented words. 2006-106 Med
a. archaic words b. sking c. advanced words d. neologisms

100. The building with numerous arches looked ____ in the moonlight. 2006-126 Med
a. Brightly b. Splendidly c. mysteriously d. magnificent

101. Her brother along with her parents ____ that she remain in school. 2005-29 Med
a. Insist b. Insists c. Are insisting d. Were insisting

102. Interpret 2005-73 Med
a. Non___ b. Un____ c. Dis___ d. Mis____

103. Note: Fill in the blank.
He asked me to bring a chair and sit _____him; 2005-123 Med
a. Next to b. Besides c. Towards d. Among

104. Fill in the blank: Two and two ____ four ; 2005-174 Med
a. Can be b. Make c. Makes d Is equal to

105. Each occupation has its own _________; bankers, lawyers and computer professionals, for example, all use among themselves language which outsiders have difficult following. 2016-40 Eng
(a) Merits (b) Disadvantages (c) Rewards **(d) Jargon**

106. Abid is _______ in his field; no other contemporary scientist commands the same respect. 2016-70 Eng
(a) Disparaged (b) Ignominious (c) Intelligent **(d) Preeminent**

107. The foreign ministers would not ______ on the talks ended in a dead lock. 2016-200 Eng
(a) Consult (b) Negotiate (c) concede **(d) Compromise**

108. The custom department _____ the goods which were being smuggled into Pakistan. 2016-150 Eng
(a) Usurped (b) Grabbed **(c) Confiscated** (d) Possessed

109. The Govt. is making arrangements to ________ the fugitive who is now being detained in a foreign country. 2016-130 Eng
(a) Exile **(b) Extradite** (c) Exonerate (d) Expel

110. Your friend proved more sympathetic than I expected he______ do. 2016-44 Med
(a) will (b) shall (c) would (d) should

111. The revolution in art has not lost its steam; it_______ on as fiercely as ever 2016-78 Med
(a) Trudges (b) Meanders (c) Ambles (d) Rages

112. As you have not prepared your work______ 2016-Med

(a) You may not fail in the examination (b) You could prepare harder next time
(c) You would do better in the examination (d) You are not likely to do well this time

113. The candidate________ when asked why he had left his last job; he did not want to admit that he had been dismissed 2016-Med
(a) Demurred (b) Confided (C) Dissembled (d) Rejoiced

114. I enjoy ______ tennis. 2017-09 Med
A) to play B) plays C) to playing D) playing

115. The path_______ paved, so we were able to walk through the path. 2017-19 Med
A) had been B) was C) has been D) being

116. While the city has earned record revenue this year,________ well behind in exports: 2017-67 Med
A. It still lag B. It still lags C. It lag still D. It lags stil

117. Every person must learn_________? 2017-78 Med
A. That how wisely his time can be used. B. To make wise use of his time.
C. That this time need a wise uses D. To using his time in a wisely manner.

118. Though Aleem is poor__________ he is honest. 2017155 Med
A. but B. nevertheless C. yet D. still

119. I am afraid we have not got_________sugar for making tea. 2018114 Med,Paper-D
A)some B)no C)any D)plenty

120. I had an unexpected guest today_____ my old classmate. 2018-176 Med Paper-D
A)it wasB)it is C)he was d)she was

121. It's raining cats and dogs. So there are ________cars on the road today. 2018-56 Med,Paper-D
A)few B)a few C)a big number of D) a great deal of.

Answer Key

1. B) Lying
2. C) Adversely
3. C) would
4. C) Should
5. C) Must
6. B) Consulted
7. D) Precocious
8. (c) had never seen
9. (d) The higher
10. (c) were
11. (a) in case
12. A) A, an and the
13. A) seems
14. D) as soon as
15. C) the John Keats
16. D) will have been
17. (c) what has held them
18. (d) would
19. (a) a few
20. (b) any
21. (b) confirmed
22. (c) hairs are
23. (d) perseverance
24. (d) through
25. (c) had better to call
26. (c) that have been
27. (a) what have been
28. (a) had better call
29. (b) was afraid of appearing
30. (c) Ours is not one of the quickest response systems
31. (c) confidants
32. (c) suspiciously
33. (b) matrimonial
34. (b) evade
35. (d) idea
36. (a) Imagined
37. (d) just laughed
38. (c) either
39. (b) will speak
40. (b) were
41. (c) planet
42. (b) I realized
43. (a) bacteria
44. a. Preparing
45. d. To see
46. a. Delinquent
47. d. So well
48. a. Incredulous
49. a. Any
50. c. Have just cleaned
51. c. Incognito
52. c. Enticed
53. c. Dictatorial
54. b. Lost
55. c. Actors
56. b. Protect
57. a. Aggrieved
58. a. Abridged
59. a. To meet
60. b. Much
61. d. Destroyed
62. b. Charitable
63. a. Valuable
64. d. Promoted
65. b. Wail
66. a. Used to
67. c. Evidence
68. c. Conspicuous
69. d. And
70. b. Lost
71. a. Tyrant
72. d. calling
73. c. would have
74. a. To let
75. c. had rained
76. d. Any
77. he belonged to
78. d. made up of
79. d. a pronoun
80. c. until
81. d. Money
82. b. Stays, will be
83. a. a 84. b. a few
85. c. Sprawled
86. a. motivates
87. b. apprehensive
88. b. Hurrah
89. b. Erratic
90. d. Television
91. a. The cinema
92. a. Breathe
93. c. Ostentation
94. d. Nut to crack
95. d. Magnificent
96. c. Has not flown

97. c. sprawled
98. a. Did
99. d. neologisms
100. d. magnificent
101. a. Insist
102. d. Mis____
103. a. Next to
104. b. Make
105. (d) Jargon
106. (d) Preeminent
107. (d) Compromise
108. (c) Confiscated
109. (b) Extradite
110.C
111.A
112.D
113.C
114.
115.A
116.B
117.B
118.C
119.C
120.A
121. A

Miscellaneous Mcqs

1. Out of the following indicate the matching item for PUPPIES 2018-02 Med Paper-D
   A)School B)Litter C) COVEY D)Group
2. Choose the related word for Rat on the analogy of Elephant: Stride 2018-15 Med,Paper-D
   A)Scamper B)Loiter C)Whimper D) gallop
3. Choose the related word for Broom on the analogy of Water: Splash. 2018196 Med. Paper-D
   A)Whisper B)Gush C)Swish D)Screech
4. Don't poke your nose my affairs__________my affairs. 2018-39 Med Paper-D
   A)in B)on C)into d)by
5. A person who leaves his country and settles in another country is called: 2018-44 Med,Paper-D
   A)Emigrant B)Immigrant C)Migrant D Aborigine
6. To the letter' means: 2018-75 Med,Paper-D
   A)Cursory B)Enveloping a letter C)Precisely D)Reporting a problem
7. *Which* way shall we go? [The underlined word is: 2018-89 Med Paper-D
   A)Demonstrative adjective B)Interrogative pronoun
   C)Interrogative adjective D)Exclamatory adjective
8. Which one of the following is opposite in meaning to word SYMPATHY 7201894 Med Paper-D
   A)Apathy B)Pathos C)Empathy D)Jealousy
9. Saba was sick on the bus. The underlined prepositional phrase functions as a in this sentence:) 2018- Med.
   A)Adjunct B)Disjunct C)Conjunct D)Adverbial
10. Enlarge upon' means 2018-Med
    A)Explain in more detail B)To make taller C) To become large D) To measure
11. My mother offered me milk. But for my life. I could not drink it
    [The underlined expression means: 2018-Med
    A)However hard I may try B)Because of my life
    C)For the sake of my life D)During my life.

Answers

1.B
2.A
3.C
4.C
5.B
6.C
7.C
8.D
9.D
10.A
11.A

Direct & Indirect;

1. He said to me, "Why have you come late?" [Indirect form of the sentence is:] 2015-30 Med
   A) He asked me why I had come late B) He asked me why I came late.
   C) He asked me why I have come late. D) He told me as to why I had cone late.
2. He said, "May this child live long!" [Indirect form of the sentence is:] 2015-90 Med
   A) He prayed that that child may live long. B) He prayed that that child will live long.
   C) He prayed that that child might live long. D) He said that that child might live long.
3. He said to me, "What a stupid fellow you arel" [Indirect form of the sentence is]: 2015-160 Med
   A) He exclaimed that I was a very stupid fellow. B) He told me that you were a stupid fellow.
   C) He exclaimed that what a stupid fellow was. D) He did tell me that I had been a stupid fellow.
4. She said to him, "where did you go yesterday" select the correct indirect speech. 2015-167 Eng
   A) She asked him where he had gone the previous day.

B) She told him where he had gone the previous day.
C) She asked him where had he gone the previous day.
D) She asked me where he had gone yesterday.

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5. Have you got a computer? She said.
Select the correct indirect speech: 2013-10 Med;
A) She wanted to find whether I have a computer.*B)* She wanted to know whether I had a computer.
C) She wanted to know if I could use computer.*D)* She was interested to know about my computer.

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6. "I saw him yesterday" she said.
Select the correct indirect speech: 2013-80 Med
A) She told that she had seen him yesterday.
B) She said that she had seen him the day before.
C) She told that she could see him the previous day.
D) She said that she would see him the day before.

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7. "I have bee to Spain," he told me. Select the correct indirect speech: 2013-200Med
A) He told me that he could visit Spain. *B)* He told me that he has visited Spain.
***C)* He told me that he had been to Spain.** ***D)* He told me that he has been to Spain.**

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8. "You really took good care of your sister," I said. Select the correct indirect speech: 2013-81Eng
A) I said that he had really taken good care of his sister.
B) I said that he had really cared good for his' sister.
C) I said that he really had taken good care of his sister.
D) I said that he had really good care taken of his sister.

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9. "I shall be in Geneva on Monday, "he said. Select the correct indirect speech: 2013-111Eng
A) He said that he would be in Geneva on Monday.
B) He said that he shall be in Geneva on Monday.
C) He told that he would be in Geneva on Monday.
D)He hoped that he could be in Geneva on Monday.

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10. "Remember to brush your teeth after dinner," she said.
Indirect form of the sentence is. 2012-17 Med
A) She told him to remember to brush his teeth after dinner.
B) She reminded him to brush his teeth after dinner.
C) She advised him to remember to brush his teeth after dinner.
D) She said to him to remember to brush his teeth after dinner.

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11. I said to him, 'Can you read this letter?'
Indirect form of the sentence is: 2012-50 Med
A) I said to him whether he read that letter. B) I asked him if could he read this letter.
C) I told him that he could read that letter. D 1 asked him if he could read that letter.

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12. He said to me, "Why have you come late" Indirect form of the sentence is: 2012-70 Med
(a) He asked me why I came late. (b) He asked me why I had come late.
(c) He asked me why I have come late. (d) He told me as to why I had come late.

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13. He said to me, " what a stupid fellow you are" Indirect form of the sentence is 2012-147 Eng
(a) he told me that you were a stupid fellow. (b) He exclaimed that I was a very stupid fellow.
(c) he exclaimed that what stupid fellow I was. (d) he did tell me that I had been stupid fellow.

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14. He said "May this child live long" Indirect form of the sentence is: 2012-180 Eng
(a) He prayed that that child may live long. (b) He prayed that child will live long.
(c) He said that that child might live long. (d) He prayed that that child might live long.

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15. He said, "If I were you, I would protest" can be indirectly reported as: 2011-111 Med
(a) if he had been me, he would have protested (b) he advised us to protest
(c) if he were me, he would protest (d) if he had been I, he would have protested

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16. Consider the following sentence: He shouted, "Let me go". Which one of the following stands for the "indirect speech" of the above sentence; 2005-92 Med
a. He requested that let him go b. He shouted to let him go
c. He shouted to them to let him go d. He imported them to let me go.

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17. He said to me," I have been looking for work, but haven't found a job". 2016-20 Eng
(a) He told me that he had been looking for work, but hadn't found a job
(b) He told me that he had looked for work, but hadn't found a job.
(c) He told me that he had being looked for work, but haven't found a job.
(d) He tolded me that he was looking for work, but hadn't find a job.

18. He said to her, "What a hot day!" Select the correct Indirect speech: 2016-90 Eng
(a) He exclaimed sorrowfully that it was hot day (b) He told her that it was a hot day
(c) He exclaimed that it was a very hot day (d) He said that it was a hot day

19. He said, "May this child live long." Indirect form of the sentence is: 2016-180 Eng
(a) He prayed that that child may live king (b) He prayed that that child will living king
(c) He prayed that that child might live king (d) He said that that child might live king

20. Anwar said, "Naveed must go tomorrow". Select the correct indirect speech: 2016-197 Med
(a) Anwar declared that Naveed must have gone the following day
(b) Anwar exclaimed that Naveed would have to go the following day
(c) Anwar said that Naveed would have to go the following day
(d) Anwar said that Naveed shall go the following day.

21. "I am disappointed that you feel you have to lie to me, lason." said his father 2016-59 Med
Select the correct indirect speech:
(a) His father said to Jason that he is sorry to feel disappointed that he has to lie to me
(b) Jason's father said to him that he was sorry that he felt he had to lie to me.
(c) Jason's father said that he was disappointed to know that he felt he had to lie to him.
(d) Jason's father was disappointed and sorry that he had to lie to him and that he felt it.

22. He asked me what my name was and what I did 2017-30 Med
A) He said to me,"What was my name and what did I do?"
B) He said to me, "What is your name and what do you do?"
C) He said to me,"What my name was and what I did?"
D) He said to me, "What his name was and what did he do?"

23. "He is busy. Would you like to leave a massage?" Said the assistant 2017-91 Med
A. The assistant told that he is busy and asked me to leave a message.
B. The assistant told that he is busy and ask me to leave a message.
C. The assistant told that he was busy and asked me to leave a message
D. The assistant told that he was busy and asked me to leave a message.

24. He said, "What is the matter"? Choose the correct indirect speech: 2018-28 Med Paper
A)He said what the matter was B)He asked what the matter was
C)He enquired that what was the matter. D)He asked that what the matter had been

25. She said, "What a lovely dress it is." [Choose the correct indirect speech: 2018-176 Med.
A)She exclaimed that it is a lovely dress. B)She exclaimed that it was a lovely dress.
C)She exclaimed that what a lovely dress it was D)She exclaimed what a lovely dress it is.

26. The teacher said, "Amna, watch your steps.
[Choose the correct indirect speech: 2018-77 Med. Paper-D
A)The teacher ordered Amna that She should watch her steps.
B)The teacher ordered Amna to watch your steps.
C)The teacher ordered Amna to watch her steps
D)The teacher requested Amna to watch your steps

27. He said to me, "traitor". 2018-57 Med Paper-D
[Choose the correct indirect speech:
A)He said to me that I was a traitor B)He told me that I have been a traitor.
C)He called me a traitor. D)He exclaimed with anger that I was a traitor.

Answer Key

1. A) He asked me why I had come late
2. C) He prayed that that child might live long
3. A) He exclaimed that I was a very stupid fellow
4. A) She asked him where he had gone the previous day
5. B) She wanted to know whether I had a computer.
6. C) She told that she could see him the previous day
8. A) I said that he had really taken good care of his sister.
9. C) He told that he would be in Geneva on Monday
10. B) She reminded him to brush his teeth after dinner
11. d 1 asked him if he could read that letter.
12. (c) He asked me why I have come late
13. (b) He exclaimed that I was a very stupid fellow

14. (d) He prayed that that child might live long
15. (d) if he had been I, he would have protested
16. b. He shouted to let him go
17. (a) He told me that he had been looking for work, but hadn't found a job
18.c(c) He exclaimed that it was a very hot day
19.c(c) He prayed that that child might live king
20. A

21.C
22.B
23.A
24.B
25.A
26.C
27.C

Passive/Active Voice;

1. "His bad friends will ruin him". Passive form of the sentence is. 2015-50 Med
A) He will ruin his bad friends. B) He is ruined by his bad friends.
C) He will be ruined by his bad friends. D) He is being ruined by his bad friends.

2. She does not wash clothes on Fridays. [Passive form of the sentence is:] 2015-130 Med
A) Clothes are not being washed by her on Fridays. B) Clothes were not washed by her on Fridays.
C) Clothes were not being washed by her on Fridays. D) Clothes are not washed by her on Fridays.

3. Will you give me your bicycle? [Passive form of the sentence is:] 2015-190 Med
A) Will your bicycle be given to me by you B) Shall you be given to me by your bicycle?
C) I shall be given your bicycle by you? D) Your bicycle will be given to me by you?

4. The police arrested him for dangerous driving. (Select the correct passive voice:) 2015-99 Eng
A) He was arrested by the police for dangerous driving.
B) He was arrested by the police for dangerous driving.
C) For dangerous driving he was arrested by the police.
D) By the police was he arrested for dangerous driving.

5. I keep the butter in the fridge. 2013-30Med
Select the correct passive voice:
a) In the fridge the butter is kept by me . b) By me is the butter dept in the fridge.
c) The butter is kept by me in the fridge. d) Dept in the fridge by me is the butter.

6. The police arrested him for dangerous driving.
Select the correct passive voice: 2013-190 Med
a) He was arrested for dangerous driving by police.
b) He was arrested by police for dangerous driving.
c) For dangerous driving he was arrested by police.
d) By police was he arrested for dangerous driving.

7. Traffic constables direct traffic.
Select the correct passive voice: 2013-21 Eng
a) Directed by traffic constables is traffic. b) By traffic constables is directed traffic.
c) Traffic by traffic constables is directed. d) Traffic is directed by traffic constables.

8. Fire destroyed the top floor of the building: 2013-90 Med
a) The top floor of the building got destroyed by fire
b) By fire was destroyed the top floor of the building.
c) Destroyed by fire was the top floor of the building.
d) The top floor of building was destroyed by fire.

9. The might promote Javed next year.
Select the correct passive voice: 2013-121 Eng
A) Javed might be promoted by them next year. B) Promoted by them Javed might be next year.
C) By them Javed might be promoted next year. D) Next year Javed might be promoted bythem.

10. Your essay impressed the lecturer.
Select the correct passive voice: 2013-171 Eng
A) The lecturer got impressed by your essay. B) The lecturer felt impressed by your essay.
C) By your essay the lecturer was impressed D) The lecturer was impressed by your essa

11. Why have you broken this jug?
<u>*Passive form of the sentence is*</u>: 2012-13Med
A) Why has this jug been broken by you? B) Why have this jug been broken by you?
C) Why this jug has been broken by you? D) Why had that jug been broken by you?

12. You did not kill a lion in the forest.

Passive form of the sentence as: 2012-30 Med
A) A lion is not killed by you In the forest B) A lion was not killed by you in the forest.
C) A lion is killed not by you in the forest. D) A lion has not killed by you in the forest.

13. Did he buy a car yesterday?
Passive form of the sentence is: 2012-140Med
A) Was a car bought by him yesterday? B) Has a car been bought by him yesterday?
C) Is a car bought by him the other day? D) Had a car been bought by him yesterday?

14. She does not wash clothes on Friday:
Passive form of the sentence is: 2012-30 Eng
(a) clohers are not being washed by her on Fridays. (b) clothes are not washed by her on Fridays.
(c) Clothes were not wasfhed by her on Fridays (d) clothes were not being washed by her on Fridays.

15. Will you give me your bicycle? Passive form of the sentence is: 2012-61Eng
(a) Will your bicycle be given to me by you? (b) Shall you be given to me by your bicycle?
(c) I shall be given your bicycle by you? (d) Your bicycle will be given to me by you?

16. "His bad friends will ruin him" Passive form of the sentence is: 2012-157 Eng
(a) he will ruin his bad friends (b) he is ruined by his bad friend
(c) he will be ruined by his bad friends (d) he is being ruined by his bad friends.

17. Consider the sentence "they made him king", four choices are given below for this sentence to be rendered into 'passive voice'. Select the correct one ; 2005-53Med
(a) He has been made king by them (b) He will be made king
(c)They will make king to him (d) He was made king

18. Aslam can readily answer any question about what is going on
Select the correct passive voice 2016-10 Eng
(a) A question is readily answered on about what is going on
(b) About what is going on, Islam can't answer readily the questions.
(c) Aslam readily answered about ongoing questions
(d) Any question about what is going on can be readily answered by Aslam

19. Somebody broke into our bungalow last Friday 2016-50 Eng
Select the correct passive voice:
(a) Our bungalow was broken into last Friday(bOut bungalow was broken in last Friday
(c) Our bungalow is broken in last Friday(dOur bungalow was broken by somebody on last Friday

20. They don't allow people to park in front of their gate
Select the correct passive voice: 2016-80 Eng
(A) People are not allowed to park in front of their gate
(B) People are un-allowed to park in front of their gate
(c) People were not allowed to park in front of their gate
(d) People were not being allowed to park in front of their gate

21. The principal has forbidden smoking on the campus.
Select the correct passive voice: 2016-79 Med
(a) Smoking has been forbidden on the campus by the principal.
(b) Smoking had been forbidden on the campus by the principal.
(c) Smoking was being forbidden on the campus by the principal.
(d) It is forbidden by the principal to smoke on campus.

22. Together the old man and the young boy washed the dishes
Select the correct passive voice: 2016-97.
(a) The old man and the young boy were washing the dishes together
(b) The old man and the young boy together washed the dishes
(C) The dishes were washed by the old man and the young boy together
(D) Together, the old man and the young boy wash the dishes

23. Communication technology has brought a tremendous revolution in modern societies
Select the correct passive voice 2016-111 Med
(a) A tremendous revolution has been brought in communication technology in modern societies
(6) In modern societies a tremendous revolutions has been brought in communication technology
(c) A tremendous revolution has brought in communication technology in modern societies
(d) Communication technology has tremendous revolution brought in modern societies

24. Why did your supervisor take such a strong disciplinary action when you were innocent? 2017- Mod
A.Why has such a strong disciplinary action taken by your supervisor when you were innocent?

B.Why was such a strong disciplinary action being taken by your supervisor when you were innocent?
C. Why was such a strong disciplinary action taken by your supervisor when you were innocent?
D. Why such a strong disciplinary action was taken by your supervisor when you were innocent?

25. The rules forbid passenger to cross the railway line. 2017-185 Med
A.Passenger were forbidden by the rules to cross the railway line,
B. Passenger are being forbidden by the rules to cross the railway line
C. Passengers are forbidden by the rules to cross the railway line
D.Passenger are forbid by the rules to cross the railway line.

26. You are called names by him [Choose the correct voice: 2018- Med Paper-D
A)He is calling you names
B)He calls you names
C)He called you names
D) You are being called names by him.

ANSWERS

1. C
2. D
3. A
4. B
5. C
6. B
7. D
8. D
9. A
10. D
11. A
12. B
13. A
14. B
15. A
16. C
17. D
18. D
19. A
20. A
21. A
22. C
23. A
24. C
25. C
26. B

PHYSICS FORMULAS

Measurements

- Smallest unit of measurement by;
- Measurement tape → 1 cm or 1mm
- Meter rule or half meter rule → 0.1 cm or 1 mm
- Vernier caliper → 0.01 cm or 0.1 mm
- Screw gauge → 0.001 cm or 0.01 mm
- $\theta = s/r$
- 2π rad = 360^0
- 360^0 = 1 revolution
- 1 radian = 57.3^0
- 1 degree = 60 minute
- 1 minute = 60 seconds
- Angle at circle is 2π radian.
- Angle at sphere is 4π steradian.
- Volume of slid cylinder = $\pi r^2 l$
- Area of sphere = $4\pi r^2$
- Volume of sphere = $4/3\ \pi r^3$
- Dimension of velocity = $[LT^{-1}]$
- Dimension of acceleration= $[LT^{-2}]$
- Energy of photon; E = hf
- Time period of pendulum; $T = 2\pi\sqrt{\frac{l}{g}}$

Vectors and equilibrium

- Commutative property of vector= A+B = B+A
- $F_x = F\cos\theta$
- $F_y = F\sin\theta$
- $F = \sqrt{Fx^2 - Fy^2}$
- $A.B = AB\cos\theta$
- $A \times B = AB\sin\theta$
- Scalar product; work and power
- Vector product; torque
- $\tau = r \times F$
- First condition of equilibrium; $\sum F = 0$
- Second condition of equilibrium; $\sum \tau = 0$

Motion and Force

- $v = s/t$
- $a = v/t$
- $v_f = v_i + at$
- $s = v_i t + ½ at^2$
- $2as = v_f^2 - v_i^2$
- $S = v_{ave} \times t$
- $V_{ave} = (v_i + v_f)/2$
- $g = 9.8\ ms^{-2} = 32\ ft^{-2}$
- F = ma
- a = v/t
- P = mv
- P = F t
- Impulse; $J = F \times t = \Delta P$
- $J = \Delta P$
- Law of conservation of momentum; $\Delta p = 0$
- Elastic collision in one dimension; $[v_1 + v_2] = [v_1' + v_2']$
- Magnitude of projectile velocity; $V_f = \sqrt{v_{fx}^2 + v_{fy}^2}$
- Height of projectile; $H = v_i^2 \sin^2\theta/2g$
- Time of flight; $T = 2\ v_i \sin\theta/g$
- Time of summit or time to reach to highest point; $T = v_i \sin\theta/g$
- Range; $R = v_i^2 \sin 2\theta/g$
- $R_{max} = v_i^2/g$
- $R = R_{max}$ at 45^0

Work and Energy

- $W = Fd\cos\theta$
- Power; p=W/t or p =Fv
- 1 watt = Js^{-1}
- 1 hp = 746 watts
- K.E = $½ mv^2$
- P.E = mgh
- Efficiency = output/input = W x D/P x d

Circular motion

- Absolute potential energy =Fr = $-GMM_e/R_e$ (- because work is done against gravity)
- Gravitational potential = E/m = GM_e/R_e
- For escape velocity compare K.E with Absolute potential energy; $v_{esc} = \sqrt{\frac{2GM_e}{r_e}}$ → $v_{esc} = \sqrt{2gr_e}$
- $G = 6.67 \times 10^{-11}\ Nm^2kg^{-2}$
- $R_e = 6.4 \times 10^6$ m
- $M_e = 6 \times 10^{24}$ kg
- $V_{esc} = 11.2 \times 10^3\ ms^{-1}$
- Wh = K.E + fh → (Wh = loss in potential energy)
- Loss in P.E = Gain inn K.E + work done against friction
- $E = mc^2$ →($c = 3 \times 10^8\ ms^{-1}$)
- Rotational and circular motion
- Angular velocity; $\omega = \Delta\theta/\Delta t$
- Angular acceleration; $\alpha = \Delta\omega/\Delta t$ → $a = \alpha \times r$
- $v = r\omega$
- $F_c = mv^2/r$
- $a_c = -(v^2/r)$
- Centrifugal force= mv^2/r
- $F\sin\theta = mv^2/r$
- $F\cos\theta = mg$
- $\tan\theta = v^2/gr$
- Torque = r F = rma = rm (rα) =(r^2m)α = I α
- Moment of inertia; I = mr^2
- Ring or thin walled cylinder inertia(I) = MR^2
- Disc or solid cylinder inertia = ½ MR^2
- Disc inertia = ½ M ($R_2^2 + R_1^2$)
- Solid sphere inertia = 2/5 MR^2
- Solid rod or meter stick inertia = 1/12 Ml^2
- Rectangular plate inertia = 1/12 M (a^2+b^2)
- Angular momentum = L = r x p = r mv = rmrω =r^2mω = Iω
- L = rmv → L/t = rmv/t = rma = rF = τ
- L/t = τ
- Linear kinetic energy = ½ mv^2
- Rotational kinetic energy = ½ $I\omega^2$
- Velocity of hoop = v = $\sqrt{gh}$
- Velocity of disc = v = $\sqrt{\frac{4}{3}gh}$
- Critical velocity = v = 7.9 km^2
- The orbital velocity = v = $\sqrt{\frac{GM_e}{r}}$
- Lift at rest → T =w
- Lift moving downward → T = w – ma
- Lift moving upward → T = w + ma
- Lift falling freely = T mg-ma = 0
- Frequency for artificial satellite → f = $\frac{1}{2\pi}\sqrt{\frac{g}{r}}$

Fluid dynamics

- Drag force → $F_d = 6\pi\eta r v$
- Terminal velocity → $v_t = \frac{2\rho g r^2}{9\eta}$
- Continuity equation → $A_1 v_1 = A_2 v_2$
- Av=ΔV/Δt = constant
- Δm/Δt = ρ ΔV/Δt
- Bernoulli's Equation = P + ½ ρv^2 + ρgh = constant
- Torricelli's Theorem → v = $\sqrt{2gh}$
- Flow meter or the venture meter → $v_1 = \sqrt{\frac{2gh}{\frac{A_1^2}{A_2^2}-1}}$

Oscillation

- Frequency → f=1/T
- Angular frequency → ω = 2πf
- Time period → T = 2π/ω
- Velocity of projection → $v_y = \omega\sqrt{r^2 - x^2}$
- Simple pendulum time period → $T = 2\pi\sqrt{\frac{L}{g}}$
- Simple pendulum potential energy = ½ kx^2
- Simple pendulum kinetic energy = ½ kx_0^2 - ½ kx^2
- Total energy of simple pendulum = ½ kx_0^2
- Resonance frequency = $F_n = nf_1$
- Phase → θ =ω t

Waves

- Transverse wave speed → $v = \frac{\sqrt{T \times L}}{M}$ or $v = \frac{\sqrt{T}}{m}$
- Longitudinal waves speed → $v = \frac{\sqrt{E}}{\rho}$
- Phase change→ 2π = λ
- Phase difference → δ = 2π/λ
- Speed of sound by newton → v = $\sqrt{\frac{\rho_m gh}{\rho}}$ = 281 ms^{-1}
- Laplace correction → v = $\sqrt{\frac{Y\rho_m gh}{\rho}}$ = 332 ms^{-1}

Chap No.11 ELECTROSTATICS

- 1 e = 1.602 x 10^{-19} C
- Q = ne
- Coulomb's Law; F = k $\frac{q1\ q2}{r2}$
- K = $\frac{1}{4\pi\varepsilon o}$
- K = 9.0 x 10^9 N $m^2 C^{-2}$
- ε_o = 8.85 x 10^{-12} $C^2 N^{-1} m^{-2}$
- $\varepsilon_r = \frac{\varepsilon}{\varepsilon 0}$
- $F_{med} = \frac{F\ vac}{\varepsilon r}$
- $E = \frac{F}{q} = \frac{V}{d} = K\frac{q}{r2}$
- Φ = E A cos θ = N $m^2 C^{-1}$
- $\Phi = \frac{Q}{\varepsilon 0}$
- E due to sheet of charge; $E = \frac{\sigma}{2\varepsilon}$
- E due to charge palates; $E = \frac{\sigma}{\varepsilon}$
- $V = \frac{W}{Q} = \frac{U}{Q}$ Volt = Joule / Coulomb
- Electric potential energy; $U = K\frac{Qq}{r}$
- Electric potential; $V = \frac{W}{Q} = \frac{Fr}{Q} = K\frac{Q}{r}$
- Potential Gradient = $E = -\frac{\Delta V}{\Delta r}$
- 1 eV =1.602 x 10^{-19} C x 1V → (1 eV = 1.602 x 10^{-19} J)
- $C = \frac{Q}{V}$ = C V^{-1} = farad
- Charge density; $\sigma = \frac{Q}{A}$
- $C_{vac} = \frac{Q}{V} = \frac{\varepsilon 0\ A}{d} = \frac{\varepsilon 0\ \varepsilon r\ A}{d}$
- $\varepsilon_r = C_{med} / V_{vac}$
- Capacitors In Series;
- Q = Q1 = Q2 =Q3
- V =V1 + V2 + V3
- 1/Ce = 1/C1 + 1/C2 + 1/C3
- Capacitors In Parallel;
- Q = Q1 = Q2 = Q3
- V = V1 + V2 +V3,
- Ce = C1 + C2 + C3
- Electric dipole; P = q d
- Energy = $U = \frac{UV}{2} = \frac{CV2}{2} = \frac{1}{2}\frac{A\ \varepsilon 0\ \varepsilon r}{d}(Ed)^2$
- Energy density; $\mu = \frac{U}{Ad} = \frac{1}{2}\varepsilon o\ \varepsilon r\ E^2$
- Maximum charge on capacitor = C x e.m.f
- q/q_0 = 63.2 % →for charging
- q/q_0 = 36.7 % →for discharging
- $q = q_0 (1-e^{-t/RC})$ →for charging
- $q = q_0\ e^{-t/RC}$ →for discharging

CURRENT ELECTRICITY

- Current, I = Q/t → C s^{-1} = A
- Drift velocity order = 10^{-5} m/s.
- V = IR
- Tan θ = I/V = 1/R
- Resistance, R = V/I → 1Ω = 1V/1A

- $R = \rho L/A \rightarrow \Omega.m$
- Conductance, $G = 1/R \rightarrow$ Siemen(S) or mho
- Conductivity, $\sigma = 1/\rho = L/RA \rightarrow$ mho/m or S/m
- Pure metals R inc with T inc.
- Electrolytes and insulators, R dec with T inc.
- $\Delta R = \alpha R_0 T \rightarrow R_T = R_0(1+\alpha T)$
- Temperature co-efficient of Resistance, $\alpha = R_T - R_0/R_0T \rightarrow K^{-1}$
- Resistivity, $\rho_T = \rho_0(1+\alpha T)$ OR $\alpha = \rho_T - \rho_0/\rho_0 T \rightarrow K^{-1}$
- Electromotive Force, $\varepsilon = W/q \rightarrow$ 1 volt = 1 joule/coulomb
- Open circuit, $I = 0$ so $V = \varepsilon$
- Terminal Voltage, $V_t = \varepsilon - Ir$
- Power, $P = W/t = VI \rightarrow$ 1 Watt = 1V x 1A
- 1 kWh = 1 unit of electrical energy
- 1 J = 1W x 1s
- Maximum output power, $(P_{out})_{max} = \varepsilon^2/4r = \varepsilon^2/4R$
- Thermo emf, $\varepsilon = \alpha T + \frac{1}{2}\beta T^2$
- KCL, $\Sigma I = 0$
- KVL, $\Sigma\varepsilon = \Sigma V = \Sigma IR$
- KCL based on L.O.C.O.CHARGE
- KVL based on L.O.C.O.ENERGY
- Wheatstone Bridge, $X = PQ/R$
- Potentiometer, $\varepsilon_2/\varepsilon_1 = l_2/l_1$
- $\tan\theta = I/V = 1/R$

ELECTROMAGNETISM

- Force on current carrying wire, $F = BIL \sin\theta$.
- Magnetic field or magnetic induction, $B = F/IL \rightarrow$ 1 tesla = 1 $NA^{-1} m^{-1}$ = 1 Wb m^{-2}
- $1\ T = 10^4\ G$
- Magnetic Flux, $\Phi = B A \cos\theta \rightarrow$ 1 Wb = 1 N m A^{-1}.
- Ampere's Law, $B \propto I/r = \mu_0(I/2\pi r)$ OR $\Sigma B.\Delta L = \mu_0 I$
- $B_{net} = B_1 + B_2$
- Magnetic field due to current carrying solenoid, $B = \mu_0 n I \rightarrow n = N/L$
- Motion of charge particle in uniform magnetic field, $F = q v B \sin\theta$
- Centripetal Force = Magnetic force $\rightarrow mv^2/r = qvB$
- Time period of charge particle in B, $T = 2\pi m/qB$
- Frequency of charge particle in B, $f = qB/2\pi m$
- Velocity selector, $F_E = F_M \rightarrow qE = qvB \rightarrow v = E/B$
- Torque on current carrying coil, $\tau = NBIA \cos\theta$
- Pestoring torque, $\tau = C\theta$
- Galvanometer, $NBIA \cos\theta = C\theta \rightarrow I = C\theta/NAB \rightarrow I \propto \theta$
- Conversion of galvanometer into ammeter, small R connected in parallel
- Conversion of galvanometer into voltmeter, large R in series are connected
- Ammeter, $R_s = R_g I_g/(I - I_g) \rightarrow$ Ideal ammeter $\rightarrow$ 0 R
- Voltmeter, $R_h = (V/I_g) - R_g \rightarrow$ Ideal voltmeter $\rightarrow$ infinite R

ELECTROMAGNETIC INDUCTION

- Faraday's Law, $\varepsilon \propto N(\Delta\Phi/\Delta t) \rightarrow \varepsilon = N(\Delta\Phi/\Delta t)$
- Lenz Law, $\varepsilon = -N(\Delta\Phi/\Delta t)$
- Flux motional emf, $\varepsilon = Blv \sin\theta$
- Rate of work done, $W = Bilv$
- Rate of production of electrical energy, energy $= \varepsilon I$
- W = energy $\rightarrow Bilv = \varepsilon I \rightarrow \varepsilon = Blv$
- Power, $P = F v$
- $\varepsilon = L\,\Delta I/\Delta t$ or $\varepsilon = N\,\Delta\Phi/\Delta t \rightarrow LI = N\Phi$
- Self-Inductance, $L = N\Phi/I$
- $\varepsilon = M\,\Delta I/\Delta t$ or $\varepsilon = N\,\Delta\Phi/\Delta t \rightarrow MI = N\Phi$
- Mutually inductance, $M = N\Phi/I$
- $F = 1/T$
- Induced emf, $\varepsilon = NAB \cos\omega t$ or $NAB\,\omega \sin\omega t$
- $\varepsilon = \varepsilon_{max} \sin\omega t$
- Back emf, $V = \varepsilon + IR$
- $N_s/N_p = V_s/V_p = I_p/I_s$

PHYSICS OF SOLIDS

- Elastic modulus $= \frac{Stress}{Strain}$
- Tensile stress $= \frac{F}{A}$
- Tensile strain $= \frac{\Delta L}{L}$
- Young modulus $= \frac{F/A}{\Delta L/L} = Nm^{-2}$
- Shear stress $= \frac{F}{A}$
- Shear strain $= \frac{\Delta x}{y} = \tan\theta$
- Shear modulus = rigidity modulus $= \frac{F/A}{\Delta x/y} = \frac{F}{A\theta}$
- Bulk or volume stress $= \frac{F}{A}$
- Bulk modulus (in fluids) $= \Delta p = \frac{F}{A}$
- Volume strain $= -\frac{\Delta V}{V}$
- Bulk modulus $= \frac{F/A}{-\Delta V/V} = \frac{\Delta p}{-\Delta V/V}$
- Stress $\propto$ strain (Hook's law)
- $A = \pi r^2$
- $W = \frac{1}{2}Fe$ (work done on stretching wire).
- Strain energy $= \frac{1}{2} F e$
- Strain energy per unit volume $= \frac{1}{2}\frac{F \times e}{A \times l} = \frac{1}{2}$ (stress) (strain)

DAWN OF MODERN PHYSICS

- $E = m_0 c^2$
- $L = L_0\sqrt{1 = v2/c2}$
- $T = t_0\sqrt{1 = v2/c2}$
- $M = m_0\sqrt{1 = v2/c2}$
- $\lambda_{max} T = 0.2898 \times 10^{-2}$ m k (Wein's displacement law)
- $E = \sigma T^4$ (Steffan-Bolts Law)
- $\sigma = 5.67 \times 10^{-8}\ Wm^{-1} K^4$
- $E = n h f$
- $K.E_{max} = e V_0$
- $K.E_{max} = h f - \Phi$
- $H f_0 = \Phi = \frac{hc}{\lambda}$
- $K.E_{max} = hf - Hf_0$
- $Hf = K.E + hf'$
- $P = \frac{E}{c}$
- $\Delta\lambda = \frac{E}{m0\, c}\, 1-\cos\theta$
- $\frac{1}{f'} = \frac{1}{f} + \frac{E}{m0\, c}\, 1-\cos\theta$
- $E_{photon} = E_{electron} + E_{positron}$
- Photon rest mass energy $= 2m_0c^2 = 1.02$ MeV
- $\frac{h}{fc} = mv_{e-} + mv_{e+}$
- $\lambda = \frac{h}{p} = \frac{h}{mv}$
- $\Delta p = \frac{h}{\lambda}$ and $\Delta x = \lambda$
- $(\Delta p)(\Delta x) = h$
- $(\Delta E)(\Delta t) = h$

ATOMIC SPECTRA

- $\frac{1}{\lambda} = R\left(\frac{1}{P2} - \frac{1}{n2}\right)$
- $R = E_0/hc$
- $R == 1.097 \times 10^7 m^{-1}$.
- $mvr = nh/2\pi$.
- h = planks constant $= 6.6256 \times 10^{-34}$ j s.
- $E = hf = E_n - E_p$
- $r_n = \frac{n2\ h2}{4\pi k m e2}$
- $E_n = -\frac{2\pi 2\ 2 k m e4}{n2\ h2}$
- $E_n = -\frac{E0}{n2} = 2.17 \times 10^{-18}$ j/ n^2 = +13.6 ev/ n^2
- $r_n = n^2 r_1 \rightarrow r_1 = 0.53\ ^0A$.
- $1\ ^0A = 10^{-}$ m
- $2\pi r = n\lambda$
- $eV \rightarrow hf_{max} = hc/\lambda_{min}$
- $\lambda_{min} = hc/eV$
- excited state for 10^{-8} s.
- metastable state for 10^{-3} s

NUCLEAR PHYSICS

- Nuclear size is of the order of 10^{-14} m.
- The mass of the nucleus is of the order of 10^{-27} kg.
- $\frac{1}{2} mv^2 = Vq$
- $Bqv = mv^2/r$
- $Bqv = mv^2/r \rightarrow m = Bqr/v$
- $\frac{1}{2} mv^2 = Vq \rightarrow v^2 = 2Vq/m$
- So $m = qr^2B^2/2V$
- $\Delta m = Zm_p + Nm_n - M_{(A,Z)}$
- The binding energy in MeV is 931 x Δm.
- The binding energy per nucleon $= E_b/A$.
- ${}_0n^1 \rightarrow {}_1H^1 + {}_{-1}\beta^0$ + antineutrino 12 MIN
- $\Delta N/\Delta t = -\lambda N$
- $R = -\Delta N/\Delta t = \lambda N$
- $N = N_0 e^{-\lambda t}$
- 1 Bq = 1 decay per second
- 1 Ci = 3.70×10^{10} decay/s
- $\lambda T\ \frac{1}{2} = 0.693$
- The charge on u,t and c, in term of electron is +2/3e.
- The charge on s,t and b in term of electron is -1/3e.
- proton =2U$\rightarrow$D.
- neutron =U $\leftarrow$2